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Immigration to the U.S.: The Unfinished Story

By Leon F. Bouvier and
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Abstract—Annual totals of new immigrants and refugees in the U.S. may now be up to the record highs of over a million immigrants counted in six years between 1905 and 1914. Since 1979, legal immigrants have averaged 566,000 a year (570,009 in 1985), newly arrived refugees and asylees approved have averaged 135,000, and the "settled" illegal immigrant population is growing by up to half a million a year, according to some estimates. Half of illegal immigrants are persons who entered the U.S. legally but then overstayed the terms of temporary visas. Immigration and Naturalization Service apprehensions of illegal aliens, projected at a record 1.8 million for fiscal year 1986, indicate a sharp increase in illegal border crossers, driven by Mexico's and Central America's mounting population and economic pressures and lured by the prospect of jobs with employers who through a loophole in U.S. immigration law can hire illegal aliens without penalty. The Census Bureau estimates that net immigration now accounts for 28 percent of U.S. population growth and will account for all growth by the 2030s if fertility stays at the current low 1.8 births per woman. Public opinion strongly favors curbs on illegal immigration and legalization of illegal aliens long resident in the U.S., and in 1986 Congress enacted legislation to reduce illegal immigration to the U.S. Asians and Latin Americans now make up over 80 percent of legal immigrants and Latin Americans comprised 77 percent of illegal immigrants counted in the 1980 census. Asians far outstrip Latin American immigrants in education, occupational status, and income and might be expected to assimilate in the same manner as earlier immigrant groups did. Hispanic immigrants so far appear to favor cultural pluralism, maintaining their own culture and the Spanish language. Research in California indicates that recent Hispanic immigrants (legal and illegal) have helped preserve low-wage industries and agriculture. Illegal immigrants appear to draw more on public health and education services than they pay back in taxes. With or without immigration reform, population and economic pressures in Mexico and the Caribbean Basin ensure that the numbers of people seeking to enter the U.S. are only likely to increase.

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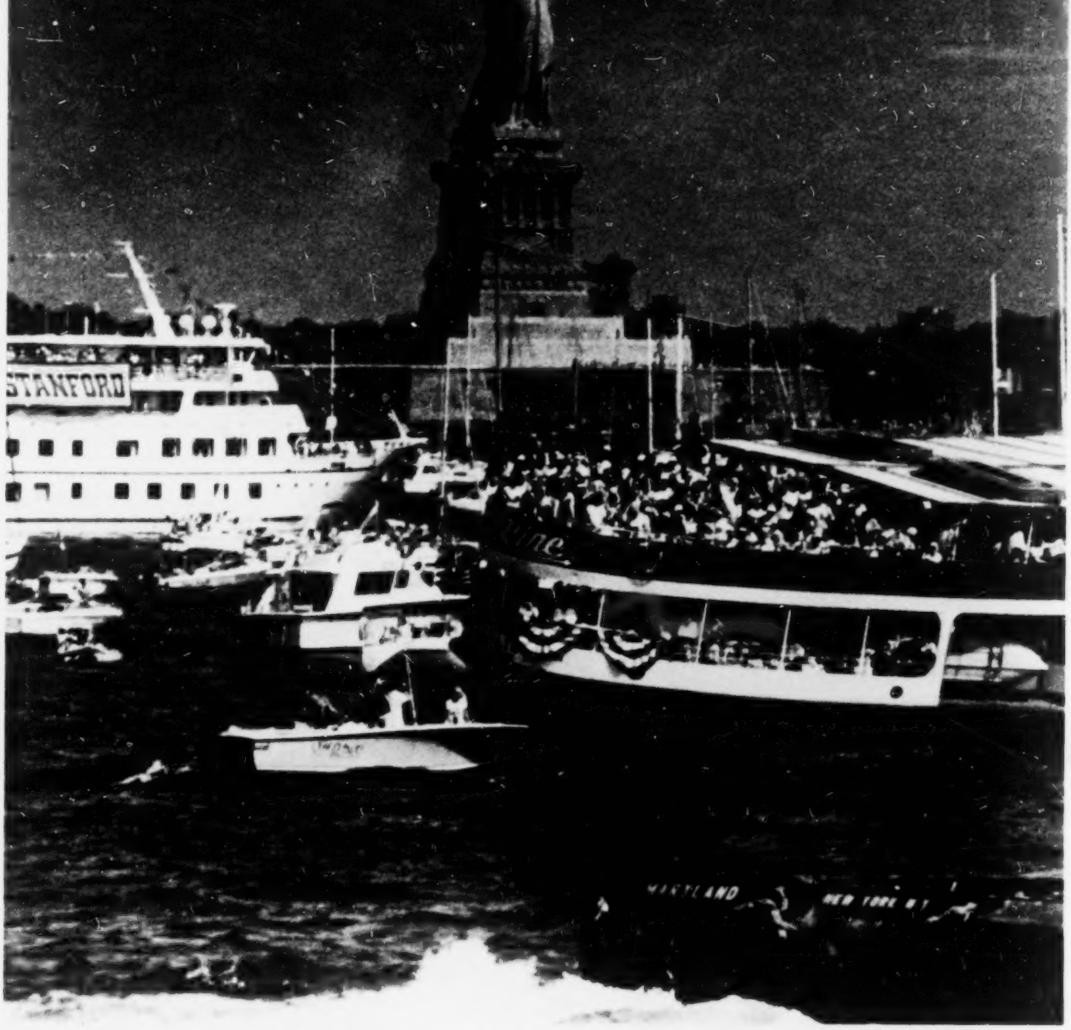

The glittering July 1986 100th birthday celebration of the Statute of Liberty reminded Americans that we are a "nation of immigrants."

Immigration to the U.S.: The Unfinished Story

By **Leon F. Bouvier** and **Robert W. Gardner**

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Shanta Danaraj of the East-West Population Institute and Wendy Patriquin and Maria Matan of the Population Reference Bureau provided valuable assistance in the preparation of this Bulletin.

The number one demographic issue on Americans' minds today is immigration. The glittering July 1986 100th birthday celebration of "Liberty Enlightening the World"—the statue that came to symbolize a welcome for the world's "huddled masses" when Emma Lazarus's poem was added to its base 17 years after its dedication—reminded us that we are a "nation of immigrants." Yet the United States is once again immersed in a debate that reflects its historically ambivalent attitudes toward immigration, as described by Population Council demographer Charles Keely:

> "On the one hand, the country has historically been a refuge, a place for new beginnings, accepting and even recruiting new settlers to build the nation and its economy. On the other hand, the theme of protectionism has found recurrent expression in apprehension over the capacity of the culture and economy to absorb newcomers, in the desire to limit labor market competition . . . and even nativism and racist theories."[1]

The number of immigrants to the U.S. in recent years may be approaching the all-time highs recorded at the turn of the 20th century. In 1907 and again in 1914, over 1.2 million immigrants came through the "Golden Door" celebrated in Lazarus's poem. In 1985 the Immigration and Naturalization Service (INS) registered 570,009 new legal immigrants—a number greater than the number of newcomers currently accepted annually by all other nations combined. How many more entered the U.S. clandestinely is impossible to determine, but the number of immigrants settled illegally in the country could be growing by up to half a million a year, according to some estimates. Many more slip across the nation's borders temporarily. In February 1986, INS Commissioner Alan C. Nelson reported that apprehensions of illegal aliens were expected to reach 1.8 million in the fiscal year ending September 30, 1986—half a million more than fiscal 1985's record total of 1.3 million. Though many of these represent repeated apprehensions of the same person, immigration officials estimate that for every undocumented entrant apprehended, two or three go undetected.[2]

Immigration has replaced fertility as the "relevant" demographic variable in U.S. population growth. Concern for the need to reduce fertility to attain zero population growth is but a memory as American women have averaged well under two births per woman since 1972. The Census Bureau estimates that net immigration (legal plus illegal immigration minus emigration) accounted for 28 percent of the nation's population growth in 1980-85 and the proportion is growing.

Still more striking is the dramatic shift in the origins of immigrants in the past 20 years. Europeans made up 90 percent of immigrants 100 years ago when the Statue of Liberty was dedicated and more than half still in 1965 when a new influx was prompted by the law change that lowered barriers that had been based largely on race. Only 11 percent of the 570,000 legal immigrants recorded in 1985 came from Europe. Asians accounted for 46 percent of the legal total and Latin Americans—mainly Mexicans and almost all Spanish-speaking—made up 37 percent. INS officials report that close to 95 percent of illegal aliens apprehended attempt to cross the border from Mexico and those numbers are surging with Mexico's and Central America's growing economic troubles and population pressures.

Polls show that Americans strongly favor setting limitations on immigration and putting an end to illegal movements into the country. Seventy-five percent of 36,000 respondents to a late 1985 *U.S. News & World Report* reader survey said they felt immigration policy should be changed to "restrict immigration further." Of 1,618 adults polled in a nationwide New York Times/CBS News survey in June 1986, 49 percent said immigration should be decreased—up from 33 percent of respondents to a Gallup Poll in 1965 when immigration law was last changed.[3]

That 1965 legislation amendment set an annual worldwide immigrant and refugee quota of 290,000 (changed in 1980 to 270,000 for immigrants plus a flexible quota for refugees, which was 67,000 in fiscal year 1986). But it left unrestricted the legal entry of immediate family members of U.S. citizens and let stand the anomaly which makes it illegal for a person to migrate into the U.S. without permission or overstay the time limits of a temporary visa but not illegal to employ such a person. Refugees were admitted in growing numbers beyond the numerical quota on an ad hoc basis during the 1960s and 1970s and under a flexible additional annual quota since the Refugee Act of 1980. As a result, immigrant arrivals and refugees adjusted admitted to legal permanent residence in the U.S. have averaged 566,000 a year since 1979, newly arrived refugees and asylees approved have averaged 135,000 annually, and the numbers of illegal immigrants lured by the prospect of jobs—especially from the debt-ridden Latin American countries closest to the U.S.—have soared.

In 1977 the Carter administration proposed new legislation to fine persons who knowingly hire illegal aliens, add 2,000 to the INS agents patrolling the U.S.-Mexican border, and implement a legalization program for illegal aliens already in the U.S. In its final report of 1981, the Carter-appointed Select Commission on Immigration and Refugee Policy recommended still more sweeping measures to stem illegal immigration and put a cap on legal immigration. Many of these proposals were incorporated in the immigration reform bill first introduced to Congress in 1982 by Senator Alan Simpson (R-Wyoming) and Representative Romano Mazzoli (D-Kentucky). During 1982-84, versions of the Simpson-Mazzoli bill passed the Senate on several occasions, and one passed the House of Representatives on the eve of the 1984 elections only to die in the Conference Committee. Immigration reform again appeared dead as the 99th Congress neared adjournment in October 1986. However, last-minute efforts led to passage by both the House and Senate of legislation imposing civil penalty fines on employers knowingly hiring illegal aliens, granting amnesty to aliens able to prove they lived in the U.S. since before January 1, 1982, and granting legal status for farmworkers who worked in the U.S. for 90 days a year prior to May 1, 1986.

The House's reluctant approach to immigration reform moves beyond a concern with sheer numbers to reflect the national controversy surrounding the social, cultural, and economic issues involved. Americans are asking how the nation can cope with the economic and social challenges posed by massive immigration. Is Spanish taking over as the nation's second language? How are the newest immigrants contributing to a changing U.S. culture? How is the economy affected by an increasingly foreign-born labor force? Are jobs being taken from American citizens or does the rapid influx of new residents help create jobs enough for all? Could the outlawing of the hiring of illegal aliens increase discrimination against native-born and legally resident Hispanic Americans? Does the promise of amnesty for illegal immigrants long resident in the country discriminate against immigrants who entered legally? Perhaps most important: Is the traditional assimilation of immigrants and their descendants into the cultural mainstream of the U.S. giving way to cultural pluralism or still another type of adaptation?

These are some of the difficult issues facing the nation as history repeats itself. A century ago, a stream of "new immigration" from southern and eastern Europe was just getting under way. The questions, hopes, and fears of that era were similar to those being expressed today and explored in this *Bulletin*.

We begin with describing the "phenomenon" of migration and its role in human history.

Migration as a Phenomenon

What is migration?

"Animals that wander must adapt or die. When man ceases to wander, he will cease to ascend in the scale of being." So wrote philosopher Alfred North Whitehead in 1925.[4] If he was right, humankind need not be concerned about ascending in the scale of being because we have always been wanderers. Fossil remains of homo erectus, among the earliest ancestors of humankind, have been found as far apart as Europe and China.[5]

From time immemorial, humans have moved either to improve their lot in life or to escape intolerable situations. Thus people are both "pulled" to what appears to be a more suitable region and "pushed" from their homeland by deplorable conditions of some sort. British geographer Edward G. Ravenstein described this phenomenon in 1889 in his Seventh Law of Migration:

> "Bad or oppressive laws, heavy taxation, an unattractive climate, uncongenial social surroundings, and even compulsion . . . all have produced and are still producing currents of migration ['push'], but none of these currents can compare in volume with that which arises from the desire inherent in most men to 'better' themselves in material respects ['pull']."[6]

U.S. demographer Everett S. Lee restated and updated Ravenstein's Laws in a classic 1966 article, "A Theory of Migration."[7] Lee argued that migrants' decisions are shaped by push, pull, and neutral factors in both the place of origin and the place of destination, and also by "intervening obstacles," such as the distance involved in the move. He defined migration as "a permanent or semi-permanent change of residence. No restriction is placed upon the distance of the move or upon the voluntary or involuntary nature of the act, and no distinction is made between external and internal migration." Migration research generally makes this distinction, however, and in this *Bulletin* we are dealing solely with "external" or international migration across national borders, specifically those of the U.S.

The number of people in any area can change only as a result of fertility, mortality, and/or migration. These are the basic demographic variables that generate all population alterations. But migration differs vastly from fertility and mortality.

First, births and deaths are biological processes that are distinct, uniform, and discrete events; migration is not biological and has no uniform process. There is a limit to the number of births a woman can have and we all die but once, but migration has no upper limit.

Second, migration necessarily involves leaving one place and entering another, so two areas should be considered when it is studied. Fertility and mortality relate to only one "move"—either entering or leaving an area.

Three, births and deaths are universals. To survive, societies require reproduction and some control over the inevitability of death. Migration is not universal, an inevitable event happening to everyone. It can be repeated and reversed. A territory could experience no migration at all, either in or out. On the other hand, entire societies can move and, indeed, this has occurred often throughout history.

Who moves?

The characteristics of movers are determined, at least in part, by whether push or pull factors predominate. People responding to pull factors are likely to be more innovative than those who stay behind. They are probably better educated, though perhaps less so than their new neighbors at place of destination. For example, often today these people are leaving less developed countries for relatively better jobs in industrialized nations. Sometimes this can be a "brain drain" for the country of origin; more often it simply eases employment pressures.

People responding to push factors in their homeland tend to be negatively selected. They have fewer of the positive characteristics, such as education, of those reacting to pull factors. There are numerous exceptions to this generalization, such as intellectuals who have fled from countries like Chile and the Soviet Union, but the uneducated usually make up a substantial proportion of negatively selected migrants.

Often push and pull factors work together. For example, the Mexican illegal worker in a Los Angeles sweatshop was pushed by the lack of job opportunities at home, but he or she was also pulled by the prospect of employment north of the border. The job may not be attractive to Americans, but it is seized by immigrants who compare the wages and conditions to what they know back home.

In today's world, refugees are perhaps the best example of persons affected purely by push factors, forced to flee their homelands for political reasons or, as in Africa periodically, because of famine. Most other migrants today appear to be better educated and more highly motivated than their nonmigrating counterparts, willing to take a chance to better their lot in life. This is as true of the poorly educated (by U.S. standards) Mexican dodging the U.S. Border Patrol as it is of the Indian engineer landing at New York's Kennedy Airport.

Why do people move?

Except for political refugees, who move for fear of their lives, most people move for economic reasons. This is what propels the Haitian risking his life in a leaking ship to get to the shores of the Virgin Islands or Florida and the trained Filipino nurse applying for a position at a West Coast hospital. To be sure, other factors are sometimes involved. Family reunification is a major reason for immigration in the U.S. today. But even here, employment is an underlying factor. Beyond the U.S., a recent example is the movement of Tamils from Sri Lanka to West Germany and finally to Newfoundland. While they left Sri Lanka reportedly as political refugees, their purpose in leaving West Germany was primarily economic. For migrants, economic rewards mean different things in different places and different eras, but the goal has always been to improve one's lot in life, through either survival or occupational advancement.

In recent centuries, most international migration has been by single persons or families. (Some refugee movements are exceptions.) Earlier movements were more likely to be of large groups either of invaders, taking over a new territory, or of people displaced by invaders or captured in slavery. Thucydides wrote of pre-Classical Greece:

> "The country now called Hellas had in ancient times no settled population. On the contrary, migrations were of frequent occurrence, the several tribes readily abandoning their homes under the pressure of superior numbers."[8]

This was a clear example of both invasion and displacement.

The early history of what is now the contiguous United States provides similar examples. Invaders from Europe—who could be viewed as "illegal" immigrants—replaced the original inhabitants of the region, who in turn migrated westward (displacement). Africans were forced to leave their homelands to become slaves to the colonists who followed the invaders.

Millions of people undoubtedly "migrated" through the centuries before the 1600s. How many is not known, but the history of humankind has been dramatically affected by these mass movements. For invading armies, the conquered lands promised untold riches; those displaced sought a better life elsewhere. Of course, slaves, like today's refugees, had no choice in the matter and were the exception to the rule that people move to improve themselves economically.

Where and when have people moved?

International migration has been substantial over the past four centuries. Foremost among the few predominant streams was the migration of more than 60 million Europeans to the New World between 1600 and 1940. Their destinations were principally the U.S. and Canada, South America and the Caribbean, Australia and New Zealand, and southern Africa.

Movements out of Asia were slight until the mid-20th century and consisted primarily, though not exclusively, of indentured workers. Indians went to East Africa, Fiji, and Trinidad; Japanese to Hawaii, the U.S., and Brazil; and Chinese to the U.S. International migration within Asia has been considerably greater, with Indians and Chinese settling in numerous other Asian countries. A "diaspora" of perhaps 30 million Chinese extends into such countries as Thailand, Indonesia, Malaysia, Vietnam, and what is now Kampuchea.

Except for slaves, few Africans left their continent before the middle of this century, but since World War II many have gone to the United Kingdom, France, the U.S., and Canada. Within Africa, long-standing tribal migrations technically became international migration when the 1880 Treaty of Berlin arbitrarily set national borders without regard to tribal boundaries. In the 20th century, there have also been large international movements of workers into the richer countries of southern Africa, to the Ivory Coast, to Ghana and Nigeria (and expulsions from both when conditions worsened), and in the 1970s and early 1980s, massive movements of refugees driven across national boundaries by war and famine, particularly from Ethiopia.

International migration among developed regions has dwindled in the late 20th century, to be replaced by soaring migration from less developed to more developed areas. Fed by cheaper and easier transportation and improved communication, the predominant streams of recent years have been from North Africa to France, from the Caribbean and Africa to the United Kingdom, from non-oil-producing Middle Eastern and Asian countries to the oil-producing Arab states, and from Latin America and

Table 1. Legal Immigration to the U.S., by Region of Last Residence: 1820-1985

(Percent of total)

Intercensal decade	Total number	Europe total[a]	North and West Europe[b]	South and East Europe[b]	Asia[c]	Africa
1820-1830	151,824	70.1	67.9	2.2	—	—
1831-1840	599,125	82.7	81.7	1.0	—	—
1841-1850	1,713,251	93.2	92.9	0.3	—	—
1851-1860	2,598,214	94.4	93.6	0.8	1.6	—
1861-1870	2,314,824	89.2	88.1	1.1	2.8	—
1871-1880	2,812,191	80.8	76.2	4.5	4.4	—
1881-1890	5,246,613	90.3	78.8	11.5	1.3	—
1891-1900	3,687,564	96.4	60.6	35.8	2.0	—
1901-1910	8,795,386	91.6	46.1	45.5	3.7	0.1
1911-1920	5,735,811	75.3	25.3	49.9	4.3	0.1
1921-1930	4,107,209	60.0	32.5	27.0	2.7	0.2
1931-1940	528,431	65.8	38.6	26.7	3.0	0.3
1941-1950	1,035,039	60.0	49.9	9.8	3.1	0.7
1951-1960	2,515,479	52.7	39.7	12.7	6.1	0.6
1961-1970	3,321,677	33.8	18.3	15.4	12.9	0.9
1971-1980	4,493,314	17.8	6.7	11.0	35.3	1.8
1981-1985	2,864,406	11.4	5.4	6.0	47.8	2.6
1985	570,009	11.1	5.3	5.7	46.4	3.0
Total 1820-1985	52,520,358	69.8	47.2	22.5	8.8	0.4

Sources: U.S. Immigration and Naturalization Service (INS), *1984 Statistical Yearbook* (Washington, D.C.: 1986) Table IMM 1.2, and unpublished data for fiscal year 1985 (October 1, 1984-September 30, 1985).

[a] Includes all of present-day U.S.S.R., except 1931-1950, when U.S.S.R. is divided into European U.S.S.R. and Asian U.S.S.R.

[b] Through 1901-1910, North and West Europe includes Austria-Hungary. After 1901-1910, Austria included in North and West Europe, Hungary in South and East Europe. Immigrants recorded as "Other Europe" (57,182 altogether through fiscal year 1984) are omitted from these two regions as shown in this table.

[c] Asia according to INS definition, includes Southwest Asia, e.g., Iraq, Israel, Syria, Turkey.

Asia (though not Japan) to the U.S. and Canada. When refugee movements are added to the already enormous amount of legal and illegal migration, it could well be that planet Earth is now witnessing the largest number of moves in history.

These migrants are reshaping the societies, economies, and demographics of both the lands they leave and their new homelands. It can now be seen that demographer Sidney Goldstein was accurate when he predicted in his 1976 presidential address to the Population Association of America that: "Migration may well become the most important branch of demography in the last quarter of the century."[9]

For U.S. demography, international migration has always been of prime importance.

Immigration to the U.S.: Before 1965

Immigration had already been occurring for centuries before the United States declared independence in 1776 and, of course, was the source of all citizens of the new country or their forebears. In fact, one justification for breaking political ties with England cited in the Declaration of Independence was King George III's "refusing to pass others [allow emigration] to encourage their migration hither." Colonial immigrants came primarily from Great Britain and northwestern Europe and settled in areas already inhabited by American Indians. These were the descendants of migrants who

Americas total[d]	Canada	Latin America[e]	Mexico
7.9	1.6	6.2	3.2
5.6	2.3	3.3	1.1
3.6	2.4	1.2	0.2
2.9	2.3	0.6	0.1
7.2	6.6	0.5	0.1
14.4	13.6	0.7	0.2
8.1	7.5	0.6	f
1.1	0.1	1.0	f
4.1	2.0	2.1	0.6
19.9	12.9	7.0	3.8
36.9	22.5	14.4	11.2
30.3	20.5	9.7	4.2
34.3	16.6	14.9	5.9
39.6	15.0	22.2	11.9
51.7	12.4	38.6	13.7
44.1	3.8	40.3	14.2
37.5	2.1	35.4	11.7
38.8	2.0	36.7	10.7
20.0	8.0	11.8	4.9

[d] Includes Canada and Latin America (see next note).

[e] Includes Mexico, Caribbean, Central America, South America.

[f] No record of immigration from Mexico, 1886-1893.

Note: A dash (—) indicates less than .05 percent.

"probably came across a land bridge between Siberia and Alaska . . . . They were Asian and although they became fantastically differentiated in language and culture, they were all biological descendants of the Mongoloid branch of humankind."[10] The Asian migrants themselves had apparently displaced a still earlier group whose origins are even less clear.

Thus the land area now occupied by the 48 contiguous U.S. states has repeatedly seen the settlement of one group, followed by immigration of another. The pattern invites conflict and conflict has indeed often resulted when established groups felt threatened by newcomers. This has been evidenced in actual violence, in prejudice and discrimination, and in local, state, and federal legislation directed against immigrants.

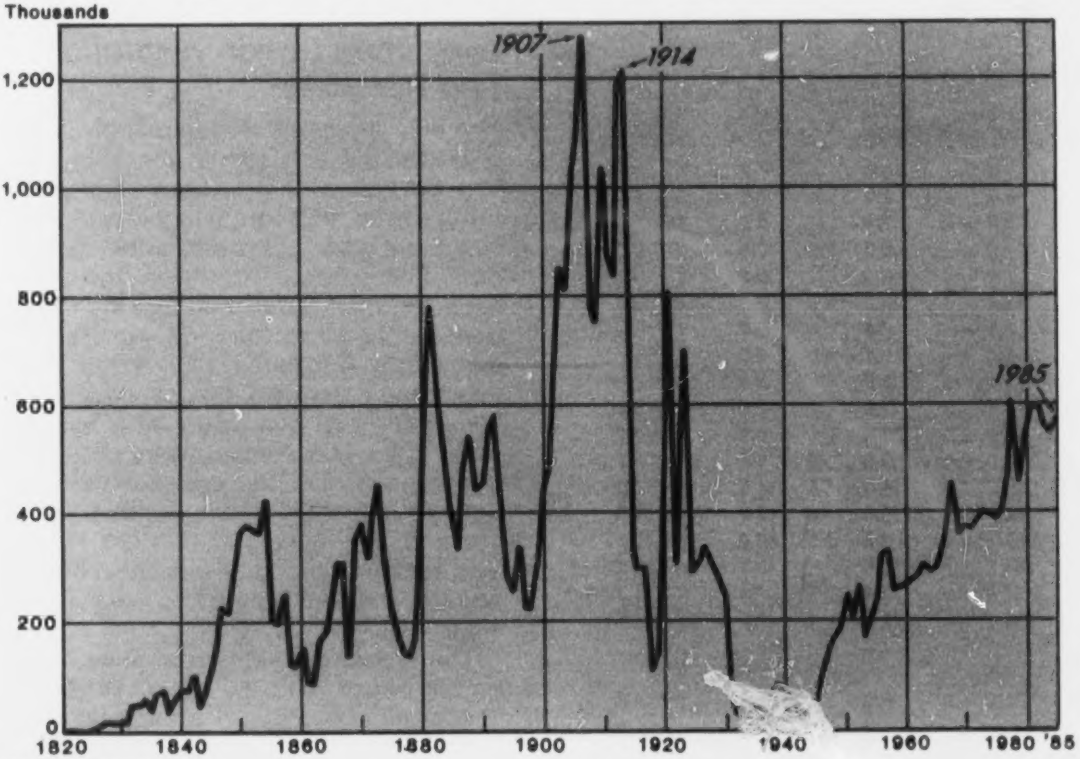
Early immigration restrictions and numbers

The first important restrictions on immigration came only late in the 19th century, but already in the nation's first years there were measures to control who could and could not reside within its borders. For example, the Alien and Seditions Act of 1789 declared that the President could expel anyone he thought dangerous. A Naturalization Act of 1790 established that any free white person "of good moral character" who had resided in the U.S. for two years could acquire citizenship. The residence required for naturalization was extended to 14 years by the Alien Act of 1798 (which also said undesirable aliens could be deported), and then cut back to five years in 1800.

The first formal efforts to count immigrants began with an act of 1819 that "required the captain or master of a vessel arriving from abroad to deliver to the local collector of customs a list or manifest of all passengers taken on board."[11] Between the end of the Revolutionary War and 1819, an estimated 250,000 foreign-born persons had arrived by ship. The data collected since 1819 probably give an accurate idea of immigrant numbers, even though they are not complete because, for example, before 1904 cabin class passengers and persons arriving overland from Mexico and Canada were counted only irregularly.

The recorded numbers add up to 52.5 million for 1820 through fiscal year 1985, ending September 30, 1985 (see Table 1). The peak intercensal decade was 1901-1910, with 8.8 million recorded immigrants, while the peak decade ever was 1905-1914, with a count of more than 10.1 million. The record single year was 1907, when 1,285,349 immigrants were counted (see Figure 1, page 10). Recently recorded annual immigration has been averaging less than half that

Figure 1. Legal Immigration to the U.S.: 1820-1985



Sources: See Table 1.

number: 566,000 for the six years from fiscal year 1980 (beginning October 1, 1979) through fiscal year 1985 (ending September 30, 1985). However, adding in plausible estimates of numbers of unrecorded, or illegal immigrants that range up to 500,000 a year (see page 37) brings current immigration levels much closer to previous highs. (The 1980-85 annual average of 566,000 legal immigrants is calculated from INS data for immigrants "admitted for permanent residence." This includes persons arriving with permanent resident visas obtained at U.S. consular offices abroad, plus persons already in the U.S. on student, tourist, and other types of temporary visas and refugees and approved asylees in the country for at least one year who are adjusting to permanent resident [immigrant] status. It *excludes* newly arrived refugees and asylees who have not yet been approved. In fiscal year 1985, for example, in addition to 570,009 legally admitted immigrants, which included 95,040 refugees and asylees adjusting to permanent resident status, 68,991 persons were admitted under the terms of the Refugee Act of 1980, including 62,477 newly arrived refugees and 6,514 persons already in the U.S. who were approved as asylees (see Figure 4, page 44).

The 53 million immigrants have come from all parts of the globe, but different countries or regions of origin have dominated the flow at different times. Immigrants from north and west Europe continued to dominate after 1820. In fact, such immigrants account for 47 percent of the 53 million and it was not until the 20th century that they made up less than half of total immigrants recorded for an intercensal decade (see Table 1 and Figure 2, page 16).

Even among Americans of similar

northern and western European ancestry, newcomers were greeted with suspicion. In the mid-19th century, "nativists" rioted against newly arrived Germans in the Midwest and formed the American Protective Association to fight the Irish. Americans of any European ancestry were wary of immigrants from outside Europe. The first such group were the Chinese, recruited to provide much-needed labor in the mines and on the transcontinental railroads in California and neighboring states, beginning in the 1850s. By the 1870s, these Asian immigrants, apparently willing to work under any conditions for low pay, were viewed by other laborers as major competitors for jobs and became victims of anti-Chinese rioting and restrictive state laws.

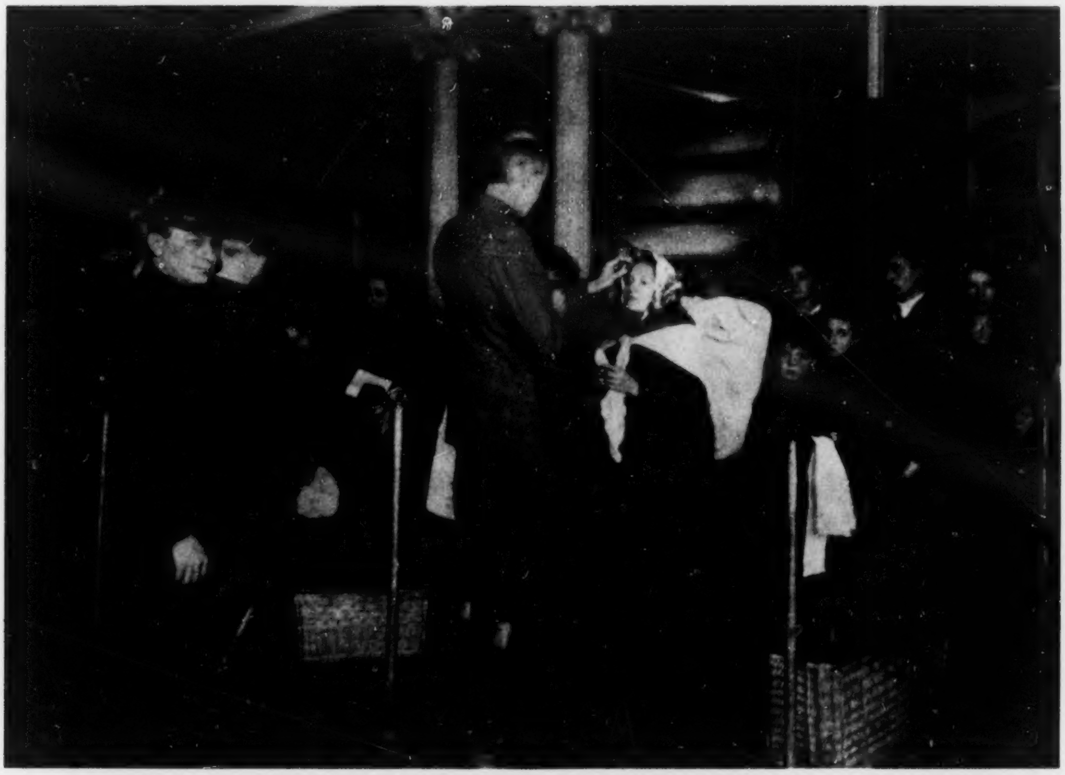
Restrictive legislation

In 1882 Congress passed the infamous Chinese Exclusion Act, barring the immigration of laborers (but not teachers, diplomats, students, merchants, or tourists) from China for ten years. The act was renewed in 1892 and 1902 and rescinded only in 1943, when the U.S. and China were wartime allies. The precedent of this act as the first exclusion of a national group was more important than its impact on immigrant numbers; at their peak, Chinese arrivals amounted only to 39,579, in 1882, compared to more than 250,000 from Germany in the same year, which was also Germany's peak immigration year. Restrictionist aims were now embodied in federal law. A "Gentlemen's Agreement" of 1907-08 with Japan barred entry to laborers from Japan (and from Korea after Japan annexed Korea in 1910) and in 1917, immigration was prohibited for laborers from an "Asiatic Barred Zone" (most of China, India, Indochina, parts of Afghanistan and Arabia, Burma, Siam, the Malay States, Asiatic Russia, most Polynesian islands, and all East Indian islands).

As immigrants from southern and eastern Europe began to gain on those from the traditional source countries of northern and western Europe, they too were seen as undesirably "alien" and threats to established "American" laborers. Numbers arriving from the two European regions were about equal in 1901-1910, but the "new immigrants" outnumbered immigrants from north and west Europe in the next ten years. A 42-volume report issued in 1911 by the Dillingham Joint Commission on Immigration, supposedly scientific and impartial, concluded that the new immigrants were racially inferior, "inclined toward violent crime," resisted assimilation, and "drove old-stock citizens out of some lines of work."[12] Eleven years later the Quota Act of 1921 established immigrant quotas for each admissible nationality based on its share of the U.S. population counted in the 1910 census; some 60 percent of the quotas went to northwestern European countries. The final definitive restrictive legislation was passed in 1924 with the National Origins Act. The quotas were similar to those of the 1921 law. As implemented in 1929, they allotted 82 percent of a maximum of 150,000 annual immigrants from the Eastern Hemisphere to countries of northwestern Europe, 16 percent to southeastern Europe, and 2 percent to all others. Totally barred from entry were all "aliens ineligible for citizenship," which effectively excluded all Asians.

Although there was still no ceiling on immigration from the Western Hemisphere, the Golden Door was far from open at the beginning of the 1930s. With the added impact of the worldwide Great Depression, immigration for the decade was reduced to barely one-eighth of the total for the 1920s and scarcely exceeded the simultaneous rise in emigration. The nadir, however, came in the war year of 1943, when only 23,700 immigrants were recorded, the lowest number since 1831 (see Figure 1).

Immigration picked up after World War II. Ad hoc measures opened the door to many displaced persons and refugees. Some Asians were accorded the right of citizenship, which also meant they could immigrate, but their quotas were tiny: for



Numbers of immigrants arriving from the two European regions were about equal in 1901-1910, but "new immigrants" from south and east Europe outnumbered immigrants from north and west Europe in the next ten years.

example, 105 a year for Chinese, beginning in 1943. Small numbers of Asians gained admission through other qualifications, such as wives of U.S. servicemen allowed entry under the War Brides Act.

The nation's immigration laws were becoming more and more obviously out of date, but new legislation was difficult to enact.

Immigration and Nationality Act, 1952

Finally, in 1952, the Immigration and Nationality Act was passed, over the veto of President Truman, who objected to its continuation of immigrant quotas. This act—also known as the McCarran-Walter Act after its congressional sponsors—is still in effect today, although heavily amended. It made some important changes in immigration law, but was basically a recodification of existing legislation. Again, no ceiling was placed on immigration from the Western Hemisphere, while the annual quota for Eastern Hemisphere was raised slightly to 158,561. Of these, 85 percent went to northwestern European countries, reaffirming the principle of national origins. The category of aliens ineligible for citizenship was abolished, thus ending discrimination on the basis of race for naturalization and hence for immigration. But the quotas were just 100 per country for all Asia Pacific Triangle countries, and 100 apiece for such countries as Egypt, Israel, and New Zealand. Germany, by contrast, was allotted 25,814 and Ireland, 17,756.

Most important, the 1952 law established a preference order for would-be immigrants. Highly skilled immigrants "whose services are urgently needed in the United States" (plus their spouses and children) could claim up to half the visas assigned to each country (see Table 2, page 14). First call on the remainder went, in descending order, to parents and unmarried adult children of U.S. citizens, spouses and unmarried adult children of aliens legally residing in the U.S., and siblings and married children of U.S. citizens. A person in the fifth category could obtain a visa only if his or her country's quota was undersubscribed.

The 1952 law did not mention refugees but did authorize the Attorney General to admit "parolees," and refugees were admitted in increasing numbers under this authorization (see "Refugees and Asylees," page 41). Also, after 1952 Congress enacted special legislation to permit immigration of spouses and children of U.S. citizens beyond the numerical quotas. As a result, numbers of admitted immigrants soared far over the 159,000 Eastern Hemisphere limit in the next decade and a half. Only an estimated one out of three immigrants of the 3.5 million admitted between 1952 and 1965 was actually a quota immigrant under the national origins system for the Eastern Hemisphere.[13]

The 1952 law also contained the so-called Texas Proviso. Apparently included at the urging of Texas agriculture interests, this provision specifically exempted employers from fines or imprisonment meted out to persons guilty of "harboring" illegal aliens. The direct result, according to many analysts, was the rising tide of illegal immigrants, primarily from Mexico, searching for work and finding it with employers who have nothing to fear from the law. Eliminating the Texas Proviso and imposing sanctions on employers of illegal aliens is a key provision in recent immigration reform legislation (see page 35).

The Texas Proviso left a loophole to lure illegal immigrants from Mexico even after the Immigration and Naturalization Service concluded that it had solved the illegal immigration problem by deporting over one million Mexicans (including some who were U.S. citizens) in its "Operation Wetback" of 1954.[14] These undocumented workers had streamed north during the 1940s and early 1950s as *braceros* spread the word of jobs to be found north of the border. Designed originally to bring temporary workers north to alleviate U.S. wartime labor shortages, the *bracero* program brought in 4.8 million temporary Mexican workers between 1942 and 1964. Its demise in 1964 probably stimulated a further influx of job-seeking Mexicans left without a legal means of entry.

The mid-1960s were a tumultuous time in the U.S., with civil rights activism and agitation against the Vietnam War. With regard to immigration, the time finally came when the discriminatory quota system was seen as outmoded and no longer reflective of the nation's values or its international political goals. Following hearings on immigration reform held by the Kennedy administration, a set of immigration amendments was signed into law by President Johnson in 1965, taking full effect in 1968 after a 31-month phase-in period.

1965 to Today

Immigration Act of 1965

Although on paper the Immigration Act of 1965 was simply a series of amendments to the 1952 Immigration and Nationality Act, it was the biggest change in immigration legislation since the 1924 law. It abolished the national origins system and discrimination against Asians. It raised the annual quota for Eastern Hemisphere immigrants to 170,000, with no more than 20,000 from any one country, and placed a ceiling of 120,000 per year on total Western Hemisphere immigration. (In 1978 this was changed to a worldwide ceiling of 290,000, with a maximum of 20,000 per country. After enactment of the 1980 Refugee Act to deal with refugees separately, the ceiling was

Table 2. Preference Systems: 1952 and 1965 Immigration Acts

Immigration and Nationality Act, 1952

Exempt from preference requirements and numerical quotas: Spouses and unmarried minor children of U.S. citizens.

1. First preference: Highly skilled immigrants whose services are urgently needed in the United States and the spouses and children of such immigrants.
   50 percent.
2. Second preference: Parents of U.S. citizens over age 21 and unmarried adult children of U.S. citizens.
   30 percent.
3. Third preference: Spouses and unmarried adult children of permanent resident aliens.
   20 percent.
4. Fourth preference: Brothers, sisters, and married children of U.S. citizens and accompanying spouses and children.
   50 percent of numbers not required for first three preferences.
5. Nonpreference: Applicants not entitled to one of the above preferences.
   50 percent of numbers not required for first three preferences, plus any not required for fourth preference.

Immigration Act of 1965

Exempt from preference requirements and numerical quotas: Spouses, unmarried minor children and parents, and parents of U.S. citizens.

1. First preference: Unmarried adult children of U.S. citizens.
   20 percent.
2. Second preference: Spouses and unmarried adult children of permanent resident aliens.
   20 percent (26 percent after 1980).
3. Third preference: Members of the professions and scientists and artists of exceptional ability.
   10 percent. Requires labor certification.
4. Fourth preference: Married children of U.S. citizens.
   10 percent.
5. Fifth preference: Brothers and sisters of U.S. citizens over age 21.
   24 percent.
6. Sixth preference: Skilled and unskilled workers in occupations for which labor is in short supply in the United States.
   10 percent. Requires labor certification.
7. Seventh preference: Refugees from communist countries or communist-dominated countries or the general area of the Middle East.
   6 percent. Removed when 1980 Refugee Act enacted, with 6 percent going to second preference.
8. Nonpreference: Applicants not entitled to one of the above preferences.
   Any numbers not required for preference applicants. Not currently being used because preference applicants take up all available places.

Note: The spouse and unmarried minor children of a visa recipient generally receive visas in the same preference category.

lowered to 280,000, then 270,000, where it is today.) Thus the Golden Door swung wide open to Asians and remained relatively wide open for immigrants from Latin America and these two regions became the major source areas for post-1965 immigration.

Also to have important consequences was the act's change in the preference system (which was extended to Western Hemisphere immigrants in 1976). From the skills emphasized in the 1952 law, there was a shift to family reunification as a rationing criterion. The first, second, fourth, and fifth preferences allotted up to 74 percent of country quotas to close family members of U.S. citizens and permanent resident aliens (see Table 2). Also, there were again no numerical restrictions on spouses and unmarried minor children of U.S. citizens, and parents were now added to this list. Another

6 percent of quotas, allocated to refugees in the seventh preference, went to spouses and unmarried adult children of permanent resident aliens (second preference) when the Refugee Act of 1980 was passed. Labor qualifications were the criteria only for the third preference (members of the professions and scientists and nonperforming artists of exceptional ability) and the sixth preference (skilled and unskilled workers "in occupations for which labor is in short supply"), with 10 percent apiece.

The emphasis on family reunification was touted as an embodiment of the nation's highest principles and efforts to change this have been met with much opposition and pious statements about the importance of the family. Some observers have suggested that this emphasis was a subtle attempt to retain the spirit of the old discriminatory system; Europeans would be far more likely than Asians to have family members already in the U.S. Also, the family reunification system effectively restricts immigration to a small segment of an origin country's population, excluding "new seed" immigrants who might bring new life, energy, and innovation to this country.

Many writers have pointed out that the scant allotment for immigrants admitted on occupational qualifications rules out consideration of current labor market needs, in contrast to Canada and Australia, whose systems allow the numbers of immigrants to be raised in times of labor shortage and restricted when unemployment is high.[15] In the U.S., legal immigrant numbers have risen steadily regardless of swings in the economy since 1965, although illegal immigration appears to be shaped somewhat by the economic climate of both the U.S. and the major source country, Mexico. Just 3.9 percent of immigrants admitted in 1985 qualified under the third and sixth occupational preferences. (See Table 5, page 18). This figure does not include family members brought along by the occupational immigrant, since they do not have to qualify.)

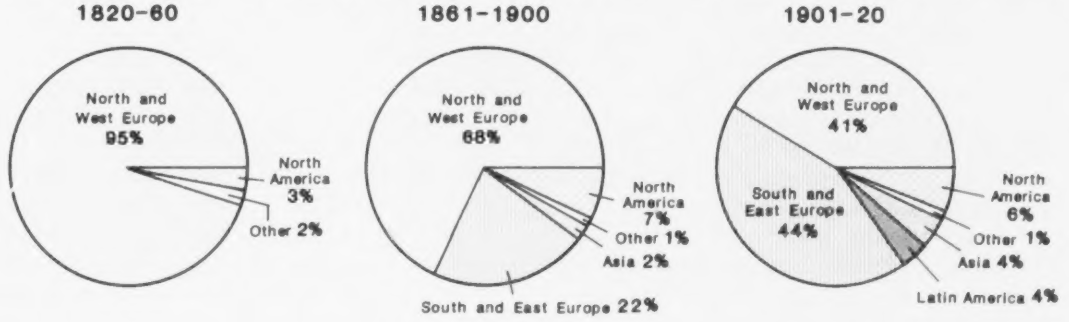
Numbers, origins, preference categories

Although legal immigrant numbers have risen steadily since the 1965 amendments took effect in 1968, the trend can be seen as a continuation of the rise beginning after World War I (see Table 1, page 8, and Figure 1, page 10). INS figures on legally admitted immigrants are 373,000 for 1970, 531,000 for 1980, and 570,000 for 1985. (As noted, these figures omit newly arrived refugees and asylees, but include those adjusting to permanent resident status.) More dramatic has been the change in the origins of legal immigrants, also a continuation of past trends. The proportion of immigrants from the traditional sending region of Europe shrank to just 11 percent by 1981-85, while the share of Asian immigrants soared to 48 percent (see Figure 2, page 16). The size of the flow from Latin America rose, but its share of the total fell from 40 percent in 1971-80 to 35 percent in 1981-85. The sudden rise in the Asian component belies the 1965 prediction of Attorney General Robert Kennedy that only a few thousand Asian immigrants might be expected after the new law took effect.

Asians have made good use of the preference system. In the years immediately after 1968, well-educated Asians took advantage of the professional preference categories to move to the U.S. or adjust from student or business visas to permanent resident status. After five years of residence they could become citizens and then were eligible to bring in immediate relatives without numerical restrictions, as well as other close relatives under the family reunification provisions of the preference system. Eventually these relatives in turn could in the same way enlarge the family groups in the U.S. further—a process known as "chain migration."

Also unforeseen by Robert Kennedy was the flood of Southeast Asian refugees admitted to the U.S. in the wake of defeat in the Vietnam War: a total of

Figure 2. Legal Immigrants Admitted to the U.S., by Region of Last



Sources: See Table 1.

761,000 between April 1975 and the end of September 1985.[16] These refugees are adding to the swelling INS count of legally admitted Asian immigrants as they adjust to permanent resident status, for which they are eligible after one year, and later as they obtain citizenship and bring in close relatives.

A major exception to the post-1965 spurt in Asian immigration are the Japanese. As a highly developed country, Japan offers its citizens as many opportunities as the U.S., if not more. Numbers of immigrants from Canada and the developed countries of Europe are dwindling as well, probably for the same reason. America is now seen as the land of opportunity mainly for people of the less developed countries of Asia, Latin America, and increasingly, Africa.

The recent increase in immigrants has reversed a 60-year decline in the proportion of foreign-born counted in the census. As seen in Table 3, this proportion of the total population fell from 14.7 percent in 1910 (and 1890) to just 4.7 percent in 1970 but by 1980 had climbed to 6.2 percent and in 1986 is undoubtedly still higher.

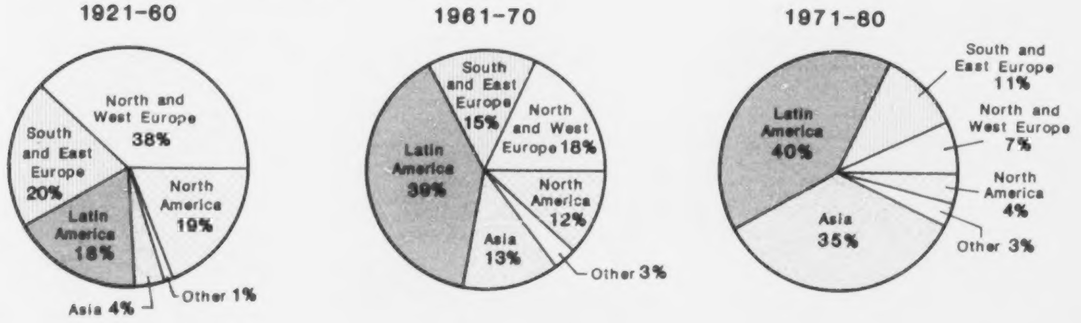
Table 3. Foreign-Born Proportion of Total Population: 1850-1980

Census year	Percent foreign-born of total population
1850	9.7
1860	13.2
1870	14.0
1880	13.3
1890	14.7
1900	13.6
1910	14.7
1920	13.2
1930	11.6
1940	8.8
1950	6.9
1960	5.5
1970	4.7
1980	6.2

Sources: 1850-1970: Bureau of the Census, *Historical Statistics of the United States: Colonial Times to 1970* (Washington, D.C.: Government Printing Office, 1975) Tables C228-295; 1980: Bureau of the Census, *1980 Census of Population*, PC80-1-D1-A, *Detailed Population Characteristics*, March 1984, Table 253.

The composition of the foreign-born population counted in the 1980 census did not yet reflect the recent dramatic changes in immigrant flows. As seen in Table 4, immigrants from regions that dominated earlier flows were more prominent among the 1980 foreign-born than they were among immigrants admitted in 1985, especially those from Europe (33.7 percent of 1980 foreign-born versus 11.1 percent of 1985 immigrants), from the U.S.S.R. (2.9 versus 0.6 percent), and Canada (6 versus 2 percent). Underrepresented by current standards were the foreign-born from South America (4.0 versus 6.8 percent), and especially Asia (18.0 versus 46.4

Residence: 1820-1985



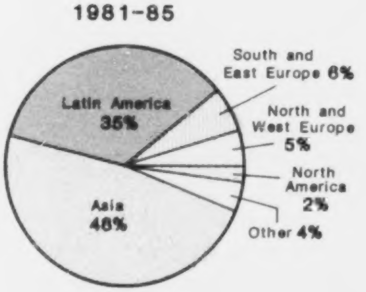


Table 4. Regions and Countries of Origin of Foreign-Born Counted in the 1980 Census and of Immigrants Admitted in 1985

Region and country of birth	Foreign-born, 1980 census (percent)	Immigrants admitted in 1985 (percent)
Total number	14,079,906	570,009
Percent	100.0	100.0
Europe	33.7	11.0
Germany	6.0	11.1
Italy	5.9	1.2
United Kingdom	4.8	2.4
U.S.S.R.	2.9	0.6
Asia	18.0	46.4
Korea	2.1	6.2
Philippines	3.6	8.4
Vietnam	1.6	5.6
North and Central America	33.1	32.0
Canada	6.0	2.0
Mexico	15.6	10.7
Caribbean	8.9	14.6
Cuba	4.3	3.6
South America	4.0	6.8
Africa	1.4	3.0

Sources: Bureau of the Census, *1980 Census of Population*, PC80-1-D1-A, *Detailed Population Characteristics*, Table 254; INS, *1985 Statistical Yearbook* (Washington, D.C.: forthcoming 1986) Table IMM 2.2.

percent). The proportion of the 1980 foreign-born from Mexico (15.6 percent) was higher than that of the Mexican-born among 1985 legal immigrants (10.7 percent), even though Mexico was the source of more legal immigrants in 1985 than any other country, with 61,077 of the total 570,009. This probably reflects the 1.1 million undocumented immigrants born in Mexico that the Census Bureau estimates were counted in the 1980 census—55 percent of the total of 2.1 million such illegal aliens counted.[17]

Table 5 (page 18) shows how dramatically the family reunification bias of the 1965 amended preference system has lowered the proportion of immigrants admitted under the employment-related qualifications of the third and sixth preferences. Since 1980, that proportion has been just 3.9 percent for all immigrants and as low as 2.5 percent for Latin American-born immigrants as a whole, and 0.1 percent in 1980 and 1.5 percent in 1985 for the Mexican-born. These figures do not include spouses and minor children, which the law specifies are to be admitted in the same category as a visa recipient. Thus a scientist may bring along his or her immediate family; all would count as third preference immigrants, but only the scientist would have

Table 5. Immigrants Admitted Under Third and Sixth Occupational Preferences: 1970, 1975, 1980, 1985

(Percent of total immigrants)

Region and country of birth	Year of admission			
	1970	1975	1980	1985
All immigrants	8.4[a]	7.0[a]	3.9	3.9
Asia	12.8	8.4	3.2	4.1
India	14.8	18.6	7.7	7.0
Korea	6.9	6.7	1.0	2.6
Philippines	20.5	11.7	0.3	2.7
Latin America	[a]	[a]	2.5	2.5
Mexico	[a]	[a]	0.1	1.5

Sources: INS, *1970 Annual Report*, Tables 6 and 7a, *1975 Annual Report*, Tables 6 and 7a, *1980 Statistical Yearbook*, Tables 5 and 6, and *1985 Statistical Yearbook*, Tables IMM 2.1 and IMM 2.2.

[a] Before 1977, immigration from the Western Hemisphere was not subject to the preference system. Thus no data are available for Latin America before that date, and data for "all immigrants" refer only to the Eastern Hemisphere.

Note: Figures are for "principals" only. They do not include the spouses and children of these principals who are permitted to enter in the same categories.

to qualify by having the necessary occupation or skill.

That family reunification determines all but a small fraction of current legal immigration does not mean that today's legal immigrants are unemployable or poorly qualified to take part in the American economy. Far from it. Many of them come from families of individuals who came under work-related preferences and hence are likely to be well-trained themselves. There is also "selection" at the origin even apart from family connections; generally only the better educated and better trained can hope to pay for and negotiate the hurdles that lie in the path of someone wishing to immigrate legally to the U.S. today.

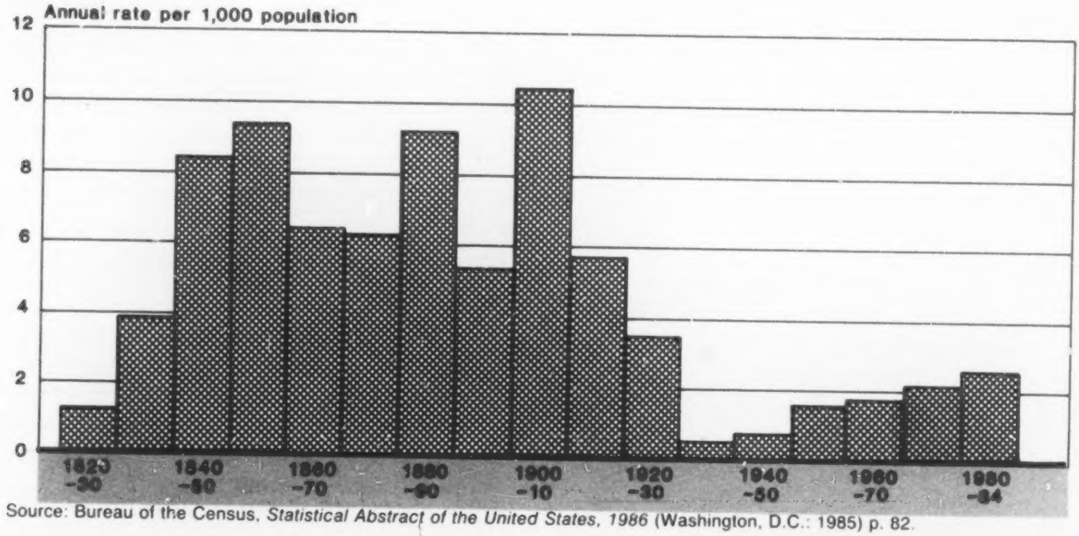
Impact on U.S. population growth

Many of today's arguments about the importance of immigration and limiting it focus on the current "record high" levels. But just what is "record high" is not always clear. Today's annual *legal* immigration, as counted by the INS, is not anywhere near the annual counts of more than a million recorded six times between 1905 and 1914 (see Figure 1, page 10). However, these figures leave out illegal immigrants and newly arrived refugees. Census Bureau analysts Jeffrey Passel and Karen Woodrow estimate current net illegal immigration—persons who live more or less permanently in the U.S.—at 100,000 to 300,000 a year.[18] Others put the figure higher (see "Illegal Immigrants," page 36). In addition, recent years have seen the arrival of large numbers of refugees and asylees from Cuba, Central America, and Southeast Asia (see Figure 4, page 44, and "Refugees and Asylees," page 41). When these numbers are added in, it may be that the total number of new U.S. residents each year is now as great as in the early 1900s.

The annual *rate* of legal immigration per 1,000 of the population already in the U.S. is currently much lower than it was for the 100 years from 1830 to 1930 when the total population of the country was much smaller (see Figure 3). From this perspective, immigration today is not nearly so great as it has been in the past, though the rate is rising. (Note that these figures do not include illegal immigrants and newly arrived refugees, and do not allow for emigration.)

The impact of immigration on current U.S. population *growth* is a different story. Populations can change size only through the differences between births and deaths (natural increase or decrease) and/or between immigration and

Figure 3. Annual Rate of Legal Immigration per 1,000 Population: 1820-1984



Source: Bureau of the Census, *Statistical Abstract of the United States, 1986* (Washington, D.C.: 1985) p. 82.

emigration (net migration). Net immigration of 500,000 a year has far less impact on population growth when annual natural increase is 3 million than when it is less than a million. With the national fertility rate down to 1.8 births per woman, natural increase in the U.S. during the first half of the 1980s has averaged slightly under 1.7 million a year, compared to 2.5 million a year during the baby boom peak decade of the 1950s, and immigration has increased. The Census Bureau estimates that *net* immigration (including net illegal immigration, which they put at 200,000 a year) accounted for 28 percent of population growth in 1980-85, compared to 11 percent in 1955-59 (see Table 6, page 20). This is not yet up to the 40 percent which net immigration contributed to population growth during the first decade of the 20th century, but the proportion will inevitably increase if fertility stays well below the replacement level of 2.1 births per woman, as seems likely.

Census Bureau projections show that if fertility were to remain constant at 1.9 births per woman (slightly higher than the rate recorded for the past decade), by the 2030s the U.S. would begin to experience natural *decrease* and further population growth would be entirely due to net immigration.[19] In the next section we present projections showing that if net immigration were constant at 500,000 a year, the U.S. population would grow from 226.5 million in 1980 to 295 million in 2040 and decline to 277 million in 2080. With net immigration of 1 million a year (possibly not much higher than today's level), the population would be 340 milliion in 2080 and still growing.

The latter projections assume that by 2030, the fertility of all immigrant women will equal the low level of white non-Hispanic women in the U.S. (which is assumed to remain constant at 1.8 births per woman from 1980 onward). For Asian women this is likely. In 1980, according to the census, the average number of children ever born for all Asian immigrant women aged 35-49, 2.3 per woman, was lower than the average for all U.S. women that age, 2.6 (see Table 7, page 21). It's true that the average was much higher for women born in Vietnam (3.6), Kampuchea (3.7), and Laos (4.9), most of whom were refugees who had arrived at the vanguard of the wave of Indochinese refugees admitted after the Vietnam War. However, later studies of Indochinese refugees show that their fertility declines with economic and cultural adjustment in the U.S. and can be expected to approach national levels in time.[20]

This is not so certain for most Latin American immigrants. In 1980 the average number of children ever born for Latin American immigrant women aged 35-49, 3.1 per woman, was higher than the average for immigrant women that age from any other region, and the rate for Mexican-born women that age was 4.2. (However, the average for Cuban-born women aged 35-49 was just 2.0 children.) Data for 1985 show that the fertility of all women of Hispanic descent remains much higher than that of other U.S. women: 107 births per 1,000 women aged 18-44, compared to 76 for black women that age, and 67 for white women.[21] Combine this with the concerns of some observers that the fertility of Hispanic illegal immigrants is very high and there is at least the potential that Hispanic immigration and subsequent fertility could add substantially to the nation's population size and growth.

Table 6. Net Immigration Proportion of Total Population Growth: 1910-1985

Period	Net immigration component of total population growth (percent)
1901-10	39.6
1911-20	17.7
1921-30	15.0
1930-34	- 0.1
1935-39	3.2
1940-44	7.4
1945-49	10.2
1950-54	10.6
1955-59	10.7
1960-64	12.5
1965-69	19.7
1970-74	16.2
1975-79	19.5
1980-85	28.4

Sources: 1901-30: Leon F. Bouvier, "The Impact of Immigration on U.S. Population Size," *Population Trends and Public Policy*, No. 1 (Washington, D.C.: Population Reference Bureau, 1981) Table 1; 1930-69: Bureau of the Census, "Estimates of the Population of the United States and Components of Change: 1930 to 1975," *Current Population Reports*, Series P-25, No. 632, July 1976, Table 1; 1970-85: Bureau of the Census, "Estimates of the Population of the United States and Components of Change: 1970 to 1985," *Current Population Reports*, Series P-25, No. 990, July 1986.

Note: Data for 1980-85 include an allowance of 200,000 per year for net illegal immigration, not included in earlier data, and estimated legal emigration is assumed to be 160,000 a year, increased from 36,000 a year for earlier data.

Ethnic composition and distribution

Like past waves of immigration, today's immigration is changing the ethnic composition of the U.S. population. The Asian American population, strongly augmented by post-1965 immigration, increased its still small share of the total from about 0.7 percent in 1970 to 1.5 percent in 1980 and 2.1 percent in 1985.[22] Hispanics, increasing through both immigration and natural increase, made up 6.4 percent of the population in 1980, and this proportion is certain to grow.

The figures are much higher in local areas. In 1980 Asians (immigrants and native-born) made up 45 percent of Hawaii's population and 5.3 percent of California's. Hispanics, concentrated especially in the border states, comprised 37 percent of New Mexico's population, 21 percent of the Texas state population, 19 percent in California, 16 percent in Arizona, and also 9.5 percent of New York's state population and 8.8 percent of Florida's.[23] Some counties, towns, and cities are now predominantly Hispanic. In 1980 the Laredo, Texas, metropolitan area population was 92 percent of Spanish origin; Las Cruces, New Mexico, 52 percent; and Miami, Florida, 36 percent.

Immigrants in general and immigrants from regions besides Asia and Latin America are also concentrated in certain states. The largest immigrant concentrations are found in the two most populous states. In 1980 California, with 10.4 percent of the national population,

Table 7. Children Ever Born of Woman Immigrants: 1980

(Average number of children born per woman)

Region and country of birth	Women's age		
	15 and over	25-34	35-49[a]
Total U.S.	—	1.5	2.6
Total Spanish origin—	—	1.9	3.2
All immigrants	2.1	1.6	2.6
Europe	2.1	1.4	2.3
U.S.S.R.	1.9	1.2	2.0
Africa	1.6	1.4	2.3
North America	2.0	1.3	2.5
Latin America	2.3	1.9	3.1
Mexico	2.9	2.4	4.2
Asia	1.9	1.3	2.3
India	1.6	1.3	2.1
Korea	1.6	1.3	2.1
Philippines	2.1	1.2	2.3
Vietnam	2.0	1.7	3.6
Kampuchea	2.0	1.9	3.7
Laos	2.7	3.0	4.9

Sources: Bureau of the Census, *1980 Census of Population*, PC80-1-C1, *General Social and Economic Characteristics*, Tables 84 and 131, and unpublished tabulations of the foreign-born by place of birth, available on microfiche.

[a] Age groups differ, depending on the source. For practical purposes, using 35-44 or 35-49 makes little difference.

contained 25 percent of all foreign-born persons and 58 percent of all the Mexican-born, as well as half of the illegal aliens counted in the census. New York, with 7.8 percent of the nation's total population, was home to 17 percent of the foreign-born population, 21 percent of the European-born, and 25 percent of persons born in the Soviet Union. This distribution follows well-trodden paths. Historically, Asian immigrants have settled in the West, where the first jobs were opened to them. Mexican immigrants, legal or illegal, have always been concentrated along the southern U.S. border, where the travel is least and the climate and culture closest to those of their home country. New York was traditionally the first stop for immigrants from Europe. With today's legislative emphasis on family reunification, it is no surprise that the latest immigrants are concentrated in the areas that have drawn immigrants from their regions in the past.

Sex and age

Traditionally, immigrants have been young adults at the stage of their lives when attachments are fewest and adaptability is greatest, and often in the past, immigrant flows have been dominated by males.

An extreme example of the latter were the first Chinese immigrants of the late 19th century. The 1890 census count of Chinese in the U.S. showed a ratio of 2,679 males per 100 females. Japanese and Filipino immigration, as well as that of other groups arriving in the U.S., was also heavily male-dominated in the early stages.

In contrast, from 1930 through at least 1979, more females than males immigrated to the U.S. in every year.[24] One reason for this was that many Korean and Filipino women immigrated as the brides of American servicemen. On the other hand, males have consistently outnumbered females among immigrants from South and Southwest Asia.

One might expect that with family reunification now the guiding principle for selection, legal immigrants would be much more "normal" and indeed, among the legal immigrants admitted in 1983 and 1984, there were about 102 males to 100 females. Family reunification does not determine refugee flows and illegal immigration, however. The sex ratio for refugees and asylees recorded by the INS in 1984 was 130 males to every 100 females. Passel estimated that the ratio for illegal aliens counted in the 1980 census was 113 males per 100 females.[25] These illegals were also heavily dominated by young adults, with 71 percent aged 15-39. Legal immigrants also seem to continue to be made up primarily of young adults.

The age and sex composition of immigrant streams has important implications for a receiving population. A balanced, "normal" immigrant population is likely to

Table 8. Educational Attainment of Total U.S. Population and Immigrants Aged 25 and Over: 1980

(Numbers in percent)

Region and country of birth	All immigrants			Immigrated 1970-74		
	No high school[a]	Completed high school	Completed college	No high school[a]	Completed high school	Completed college
Total U.S.	18.3	66.5	16.2	—	—	—
All immigrants	35.6	53.1	15.8	35.5	54.3	20.3
Europe	37.8	51.2	12.1	37.2	53.8	14.9
U.S.S.R	37.9	50.2	17.1	17.8	70.4	30.7
Africa	11.6	81.9	38.7	7.3	88.0	45.6
North America	20.4	61.8	14.3	9.1	74.4	25.5
Latin America	47.6	41.0	8.9	51.7	36.1	6.4
Mexico	68.4	21.3	3.0	72.0	17.2	2.1
Asia	18.9	73.0	35.9	14.0	78.9	43.9
India	5.6	88.9	66.2	4.0	91.3	69.9
Korea	14.0	77.8	34.2	12.8	78.8	34.2
Philippines	18.3	74.0	41.8	11.2	82.7	53.5

Sources: Bureau of the Census, *1980 Census of Population*, PC80-1-C1, Table 83, and unpublished tabulations of th foreign-born by place of birth.

develop much more quickly and easily into a settled community than an unbalanced one. The almost all-male immigrants building the transcontinental railroads in the last century invited social disorganization and conflict with other groups, who viewed them as threats.

Socioeconomic characteristics

Are immigrants likely to contribute to American society or do they represent a burden and a threat? The questions have been asked for as long as newcomers have been arriving in the U.S., and with renewed vigor today. Though the immigrant contribution to this country cannot be overemphasized, nativist and restrictionist are once again to be heard.

To judge the impact of today's immigrants we look at INS data on the occupational characteristics of immigrants admitted in 1985, which can tell us something of immigrants' potential impact as they arrive (or adjust status from being nonimmigrants), and at 1980 census data on the education, employment, occupation, and income of the foreign-born, which gives us an idea of immigrants' situation after they have been living a while in the U.S. Education, employment, and occupation determine much of a person's place in society and are strongly correlated with income—perhaps the ultimate measure of "success" in the U.S. They are also associated with the impact immigrants have on the host society; for example, poorly trained immigrant laborers may displace unskilled native-born teenagers and less-educated blacks from some low-level jobs, and immigrant engineers compete in a tight job market with native-born engineers. Much of the current controversy about immigration, especially illegal immigration, focuses on job displacement and employment effects, real or imagined.

Education

Our data on immigrants' education—not collected by the INS—come from the census and refer to 1980, but the situation is not likely to have changed much since then.

In 1980, 67 percent of the total U.S. population aged 25 and over had at least completed high school (see Table 8, left panel). The proportions were well above

Immigrated 1975-79		
No high school[a]	Completed high school	Completed college
—	—	—
30.7	59.3	23.8
23.5	67.7	26.4
17.9	69.2	38.6
6.5	88.8	41.8
5.6	80.0	32.5
53.2	35.4	8.5
74.0	16.7	3.4
19.6	71.8	33.3
8.5	83.3	56.9
14.9	76.3	29.7
19.9	72.0	42.7

[a] No more than 8 years of education.

this for immigrants from Africa (82 percent), from Asia (73 percent), and especially for Indians (89 percent). For all immigrants from Latin America, the proportion was 41 percent, and for the Mexican-born, just 21 percent. This suggests that Asian immigrants enter one sector of U.S. society and Hispanic immigrants another.

From the data in the middle and right-hand panels of Table 8, we can see if the educational attainment of immigrants—which probably changes little after arrival for those who come as adults—has shifted in the years since the 1965 law amendments. For immigrants as a whole, educational levels appear to have improved; for example, 24 percent of immigrants who arrived in 1975-79 had completed college, compared to 20 percent of those arriving in 1970-74. Regionally, this improvement is true for immigrants from Europe and North America (mostly Canadians), but not for Asians, and especially not for Indians. The percentage of Indians with no high school education rose from 4 to 9 percent and the percentage with a college degree fell from 70 to 57 percent. This illustrates Asians' use of the preference system after the 1965 law change, as described earlier. Since there were few Indians in the U.S. in 1965, the first immigrants to be admitted came in under the occupational categories, which favored the well-educated. Later Indian immigrants could then be brought in under the family reunification procedures and were likely to be less well educated. Indians are still the best educated of all immigrants, but their average level of education is falling somewhat.

Employment and occupation

Education, of course, is no guarantee of success. Whether or not one can find a job and the status of that job are better measures of success.

In 1980, 62 percent of the total U.S. population aged 16 and over was in the labor force, either working or looking for work (see Table 9, page 24). For all immigrants of that age counted in the census the figure was a bit lower, 56 percent, but it was about the same for immigrants from Asia (63 percent), higher for Latin Americans (66 percent), and especially high for Filipinos (73 percent), and Indians (75 percent).

Of all immigrants in the labor force, 93.3 percent were employed at the time of census—virtually the same as the national figure (93.5 percent). The employment figures were higher, and the unemployment figures lower than the national average for immigrant workers from Europe, North America, and Asia. But the reverse was true for Latin American immigrants, with 10 percent of the Mexican-born workers out of work at the time of the census.

Of the 570,009 new legal immigrants recorded by the INS in 1985, only 221,873, or 39 percent, listed an occupation; most of the rest were nonworking spouses and children. The occupations of 18 percent of those with an occupation were classified as "professional specialty," and an additional 9 percent came in the "executive, administrative, and managerial" category.[26] These two categories, adding up to 27 percent for

Table 9. Labor Force Participation of Immigrants Aged 16 and Over: 1980

Region and country of birth	Percent in labor force	Percent of those in labor force currently employed
Total U.S.	62.0	93.5
All immigrants	55.8	93.3
Europe	47.4	94.5
U.S.S.R.	34.8	92.6
Africa	60.8	93.1
North America	50.3	95.2
Latin America	66.0	91.5
Mexico	64.2	90.2
Asia	62.6	94.6
India	74.7	94.6
Korea	63.8	94.2
Philippines	72.4	95.6

Sources: Bureau of the Census, *1980 Census of Population*, PC80-1-C1, *General Social and Economic Characteristics*, Table 86, and unpublished tabulations of the foreign-born by place of birth.

1985 immigrants, are usually grouped together to represent the most prestigious and well-paid jobs. At the other end of the scale, 22 percent of 1985 immigrants with occupations were classified as "operators, fabricators, and laborers," a low-status category. Immigrants from Europe, Asia, Africa, and especially Canada had relatively high proportions in the top-ranked occupations and lower than average proportions in the low category, while the reverse was true for immigrants from the Caribbean and Central and South America.

Some 20 percent of the 1985 immigrants who gave occupations were classified as service workers. Showing higher than average concentrations in this category were immigrants from Africa and Latin America.

Information on the occupations of immigrants when they are admitted to the U.S. is not a sure predictor of where in the job market they will settle, since many have trouble at first finding comparable jobs, particularly professionals and those with a poor command of English. The data on 1985 immigrants' occupational status can be compared with the similar 1980 data shown in Table 10 for earlier immigrants and the total U.S. population. The proportion of 1985 immigrants in the top-ranked executive and professional categories (27 percent) was higher than that of all employed persons in the U.S. aged 16 and over in 1980 (23 percent) and also higher than the proportion for all immigrants counted in the

Table 10. Occupation of Employed Immigrants Aged 16 and Over: 1980

(Percent of total workers)

Region and country of birth	Managers, professionals, and executives	Sales and administrative, support	Services	Operators, fabricators, and laborers
Total U.S.	22.7	27.3	12.9	18.3
All immigrants	21.2	21.5	16.1	22.1
Europe	23.9	22.8	14.8	18.4
U.S.S.R.	27.8	22.8	12.2	17.0
Africa	36.1	23.5	14.2	12.9
North America	29.6	29.6	11.4	12.3
Latin America	11.2	17.9	18.0	31.3
Mexico	5.4	10.2	16.6	39.3
Asia	31.1	22.1	16.2	15.3
India	55.3	17.4	5.3	6.0
Korea	24.5	23.1	17.0	21.2
Philippines	28.1	26.0	16.2	13.2

Sources: Bureau of the Census, *1980 Census of Population*, PC80-1-C1, *General Social and Economic Characteristics*, Table 89, and unpublished tabulations of the foreign-born by place of birth.

Table 11. Median Income of Immigrant Workers: 1979

(Workers aged 15 and over)

Region and country of birth	Males		Females	
	Median income all workers	Median income full-time workers	Median income all workers	Median income full-time workers
Total U.S.	$12,192	$17,363	$5,263	$10,380
All immigrants	10,542	—	5,094	—
Europe	12,344	—	4,850	—
U.S.S.R.	9,465	20,098	4,344	12,034
Africa	11,003	18,014	5,760	11,093
North America	13,539	21,091	5,218	12,062
Latin America	9,019	12,255	5,184	8,681
Mexico	8,192	10,809	4,442	7,408
Asia	11,412	17,557	6,328	11,384
India	18,421	22,649	7,162	13,138
Korea	12,111	17,607	6,011	10,092
Philippines	11,190	15,240	8,713	12,715

Sources: Bureau of the Census, *1980 Census of Population*, PC80-1-C1, *General Social and Economic Characteristics*, Table 107, and unpublished tabulations of the foreign-born by place of birth.

census in 1980 (21 percent). On the other hand, the proportion in the laborer category was 22 percent for both the 1985 immigrants and those in the U.S. in 1980, and both were above the national 1980 average of 18 percent. The proportions in services were also higher for 1985 immigrants (20 percent) and 1980 immigrant workers (16 percent) than the national average in 1980 (13 percent). In between, in sales and administrative support, lower-level white-collar occupations, the proportions were only 14 percent for 1985 immigrants and 22 percent for all immigrant workers in 1980, compared to 27 percent for the nation as a whole. This pattern has been noted before among legal immigrants: a concentration in the upper and lower occupations, with relatively few in the middle-level white-collar occupations.

The 1980 occupational distribution of immigrants from different regions was similar to that of the 1985 immigrants. The percentages in the executive and professional category were especially high for immigrants from Africa (36 percent), Asia (31 percent), and particularly India (55 percent), and low for all immigrants from Latin America (11 percent) and just 5 percent for the Mexican-born. Mexican-born workers also stand out as having the highest percentage (39) in the laborer category.

Income

Educational qualifications and even a good occupation do not necessarily add up to a good income, of course, and it is perhaps income which best summarizes a group's position in U.S. society. The 1979 median income (reported in the 1980 census) of all foreign-born male workers in the U.S. was $10,542, somewhat below the figure of $12,192 for the total employed male population (see Table 11). Above this level were immigrants from North America, or Canada ($13,539), Europe ($12,344), Asia ($11,412), and Africa ($11,003); trailing were immigrants from Latin America ($9,019). For females the picture was similar, although incomes were substantially lower, as is universally true in the U.S. work force. The median for all female immigrant workers was $5,094, compared to a total population average of $5,263, with immigrants from Asia regionally highest ($6,328). Female immigrant workers from Africa were also above the average ($5,750), as were those from North America ($5,218) and, surprisingly, Latin America ($5,184).

In sum, today's legal immigrants generally compare well with U.S. residents socioeconomically, but some come better equipped than others. In particular, differences in education, occupation and income between Hispanics and Asians—who make up the overwhelming majority of immigrants—suggest that a two-tiered society could emerge, with Hispanics competing with poorly educated blacks for low-level service and laborers' jobs and Asians competing with middle- and upper-class blacks and whites for the well-paid, specialized jobs of America's increasingly high-tech society.

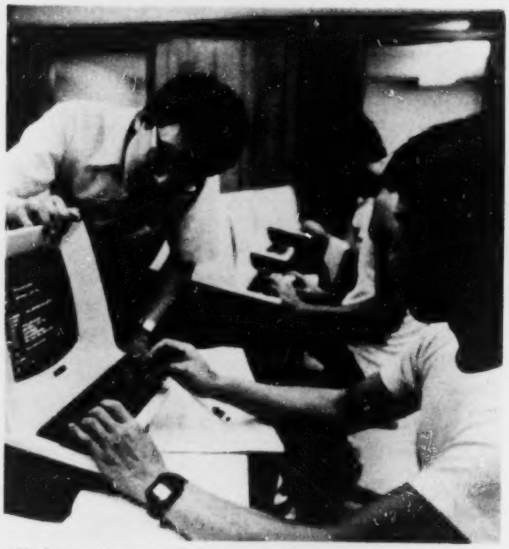
Impacts and Issues

Many issues emanate from substantial immigration. The impact of immigrants on jobs and the economy has always concerned Americans. Some have feared the social and cultural impacts. Both immigrants and established residents are concerned with how they will adapt to the changing nature of society. Much of that change is determined by demographic factors.

Changing demographic picture

With shifts in fertility, mortality, and migration, the population of what is now the United States has gone through several radical changes in its makeup. In early history, the region inhabited by Native Americans came to be populated primarily by white immigrants and their descendants, with a mingling of black slaves and their descendants and early Asian immigrants. At the turn of the 20th century, the complexion of what had been the predominantly Anglo-Saxon white population began to change, as millions of Italians, Greeks, Poles, and others from south and east Europe sailed through the Golden Door and the fertility of the U.S. resident population declined.

Today a new demographic phenomenon is occurring. Since 1972 the fertility of American women has been below the level of 2.1 births per woman needed to replace the population in the long run, in the absence of migration, and the prospects are that fertility will stay low. If the current fertility rate of 1.8 births per woman were maintained indefinitely and immigration ceased immediately, within two centuries the U.S. population, which numbered 242 million in mid-1986, would dwindle to less than 100 million. However, immigration levels now approach the high levels of the early 1900s and well over 80 percent of current immigrants come from either Asia or Latin America.



Highly educated Asian immigrants come well equipped to compete in America's increasingly high-tech society.

Applying stable population concepts to this new phenomenon, Espenshade, Bouvier, and Arthur have shown that "as long as fertility is below replacement, a constant number and age distribution of immigrants (with fixed fertility and mortality schedules) leads to a stationary population."[27] This happens no matter what the size of annual immigration. When this zero-growth stage is reached, all of the population will be comprised of immigrants arriving after the date chosen for the beginning of the exercise and their descendants.

Bouvier and Davis have applied these

theoretical findings to the real world situation in the U.S.[28] Of the 226.5 million U.S. population in 1980, 79.9 percent were non-Hispanic whites, 11.7 percent were blacks, 6.4 percent Hispanic, and 2.0 percent Asians and others. If the fertility of all groups converges by 2030 at the non-Hispanic white rate of 1980 (1.8 births per woman) and if net immigration is limited to 500,000 a year (a number that obviously excludes any illegal immigration), U.S. population is projected to grow to 267 million in 2000, 295 million in 2040, and drop to 277 million in 2080. By then, 22 percent of the population would be post-1980 immigrants and their descendants. With the same fertility assumption but with annual net immigration increased to 1 million to include illegal entries, the totals would be 279 million in 2000, 334 million in 2040, and 340 million in 2080, with 37 percent of the 2080 population made up of post-1980 immigrants and their descendants.

Even though immigrants are younger on average than the general U.S. population, the U.S. population is destined to become older so long as fertility stays low; immigration will retard this aging only slightly. No matter what the annual level of immigration, if fertility continues at 1.8 births per woman, by 2030 when almost all of the giant baby boom generation born from 1947 to 1964 has reached retirement age, some 20 percent of the population will be aged 65 and over.[29]

Immigration in combination with below-replacement fertility would have more effect on the ethnic composition of the population. With immigration of 500,000 annually, and fertility constant at 1.8 births per woman, just under 60 percent of the population of 2080 would be non-Hispanic whites, down from 80 percent in 1980. Hispanics would increase from 6.4 to 16.1 percent, Asians from 2 to 10 percent, but blacks only from 12 to 15 percent.

If illegal immigration remains high and annual immigration averages 1 million, the non-Hispanic white proportion would drop to just under 50 percent in 2080; Asians would be up to 12 percent; Hispanics would be 23 percent, having already in 2010 surpassed blacks to become the largest ethnic minority in the nation; and blacks would be only 14.7 percent. By about 2075, non-Hispanic whites would form the largest minority in a nation without any ethnic majority population.

As we have seen, immigrants are concentrated in a few states. About two-thirds of all newly arrived immigrants settle in just five: California, Texas, New York, Florida, and Illinois. Indeed, some 40 percent live in California and Texas. These states will be much more affected by immigration than Minnesota or Mississippi, for example. Recently prepared projections assuming low fertility and with conservative assumptions for immigration based on recent trends, point out what the next 50 years could hold for California and Texas.[30]

California's population is projected to grow from the 24 million of 1980 to more than 43 million in 2030. In 1980 non-Hispanic whites made up about two-thirds of the state's population, but by 2010 a majority of the population will consist of Hispanics, blacks, and Asians and there will be no majority ethnic group. In 2030 Hispanic and non-Hispanic white numbers will be virtually equal, each representing 38 percent of the population. Asians will be up to nearly 16 percent, from 5.6 percent in 1980, and the black proportion will have slipped from 7.5 percent in 1980 to less than 7 percent.

The scenario for Texas is similar. The state's population is projected to grow from 16 million in 1985 to 30 million in 2035. Over that 50-year period, the non-Hispanic white proportion will decline from 63 to 43 percent, the Hispanic share will increase from 23 to 39 percent, the Asian share will go up from 2 to 6 percent, and the black proportion, as in California, will decline slightly, from 12 to 11 percent.

This nation must once again redefine itself. As Harvard sociologist Nathan

Glazer recently put it: "The United States, it seems, remains the permanently unfinished country."[31] The challenges of such major ethnic shifts should not be minimized, but neither should they be viewed with too many misgivings. The nation is resilient and with adequate planning any problems posed by such changes can be addressed.

Immigration and the economy

Perhaps no aspect of immigration is more controversial than its effect on the nation's economy. Do immigrants, legal as well as illegal, take jobs away from citizens and permanent residents of the nation and depress wages? Do they draw more on public services than they pay back in taxes? Are immigrants needed to fill a potential U.S. labor shortage?

On the face of it, immigrants may appear to have a positive effect on the economy. Indeed, the 1986 Annual Report of the Council of Economic Advisors states unequivocally:

> "There is evidence that immigration has increased job opportunities and wage levels for other workers . . . . Immigrants come to this country seeking a better life, and their personal investments and hard work provide economic benefits to themselves and to the country as a whole."[32]

Writing in 1974, demographer Kingsley Davis saw it differently:

> "So dubious are the advantages of immigration that one wonders why the governments of industrial countries favor it . . . . One will find few clarifications, but official statements hint that the goals are to fill essential jobs and to stimulate population growth. One suspects that the actual causes are government inertia and pressure by employers to obtain cheap labor."[33]

More recently, Colorado Governor Richard D. Lamm wrote:

> "I do not believe that massive immigration is the only cause of unemployment or poverty, but I know it is a significant cause of them. I do not think we can cure the ills of unemployment by eliminating illegal immigration, but I know that allowing it to continue certainly makes unemployment worse."[34]

Jobs and wages

Debate on immigrants' impact on jobs and wages has been heated for 150 years and more: with the coming of the Irish and later the Italians, Greeks, and Poles in New York; with the arrival of the Chinese and later the Japanese in California; and now with the latest surge of illegal immigrants across the U.S.-Mexican border. Business and agricultural sectors who benefit from lower wage structures have generally favored immigration; workers and organized labor who perceive a threat to jobs and wages argue for restrictions.

Congress has reflected the controversy in its years of wrestling with currently proposed immigration reform bills, first introduced in 1982. For example, on June 13, 1984, Congressman Clay Shaw (D-Florida) commented: "The people left out of the [immigration] debate are the American workers who are being discriminated against, because they are losing jobs to illegal aliens who are coming to this country and working for less." A week later, Congressman Jack Kemp (R-New York) insisted that immigrants (legal or illegal) do not take jobs from Americans.[35]

Researchers have taken up the issue. Though their findings are often contradictory and tend to rely on less than adequate data, these are serious attempts to unravel a complex problem. Two recent studies have examined the impact of Hispanic immigrants on the economy of California, where one-third of all the nation's immigrants settle.

The Urban Institute, after detailed examination of southern California's employment situation in the early 1980s, was generally optimistic about the economic impact of Hispanic immigrants, including illegal immigrants. In their final report of 1985, *The Fourth Wave,* economists Thomas Muller and Thomas Espenshade, write: "The evidence . . . points to the conclusion that the influx of Mexicans to Los

Angeles and southern California during the 1970s did not increase the aggregate level of unemployment among non-Hispanic California residents, including blacks."[36] Rather, they found, the native-born are replaced in lower status jobs and in turn move up the economic ladder. "While some nonimmigrants, both blacks and others, were probably displaced from low-wage jobs, others gained from the presence of a larger population."[37]

The *Fourth Wave* does note that Hispanic immigrants reduced average wages in low-skill occupations:

> "We conclude that there is evidence of wage depression attributable to immigrants. The presence of a growing immigrant work force is responsible for the slower rate of average wage increases observed in these low-wage, labor-intensive manufacturing industries, and the resulting lower wage levels account for the growth of employment in these industries."[38]

Indeed, the authors found that wages in the manufacturing sector had fallen below the national average by 1980. However, they note:

> "Since most of the added jobs in highly internationally competitive sectors can be related to the presence of alien workers, the absence of these workers would not have resulted in more jobs for native-born Americans. Thus, these jobs are net additions to the economy, as the goods produced are in most instances substitutes for foreign imports. In the absence of finding workers willing to work at wages offered, at least some of these jobs would now be in the Far East or perhaps the Mexican side of the Rio Grande."[39]

Demographers Kevin F. McCarthy and R.B. Valdez came to essentially the same conclusions in a Rand Corporation study, reported in 1985:

> "Mexican immigrants appear to have stimulated total employment in the state by providing a pool of low-wage labor that has supported industrial and manufacturing growth . . . the negative labor market effects of immigrants have been minor and have consisted primarily of lower wages for native-born Latin workers . . . . Our evidence suggests that Mexican immigration has provided a boost to California's economy, especially in the Los Angeles area, by enabling many low-wage industries to continue to expand at a time when their counterparts were contracting in the face of foreign competition."[40]

In sum, these studies suggest that immigration, particularly of Hispanics and including illegal immigration, has created more jobs without any severe displacement of native-born workers, at least in the long run. However, this finding results to a considerable extent from the fact that these immigrants found jobs in California's low-paying industries, as well as in agriculture. Economist Philip Martin of the University of California at Davis has elaborated on the implications of a low-paid work force for agriculture. Addressing the issue of temporary farm workers, he points out:

> "If farmers have to scour the U.S. looking for workers and must offer high wages . . . and other amenities, they will find more American workers and will need fewer foreign ones. They will also have a greater incentive to mechanize. On the other hand, if farmers have few obligations in recruitment, wages and housing, they will find it easier and cheaper simply to hire aliens."[41]

He goes on:

> "The continued dependence of the $18 billion fruit and vegetable industry in the U.S. on alien farm workers spells disaster in the long run. The industry has two choices: it can move toward mechanization . . . or it can obtain access to a rotating pool of alien farm workers with another program of the *bracero* type."[42]

Martin extends his observations to the industrial segment of the economy:

> "Modern industrial economies can experience rising per capita incomes without population growth or immigration by providing more and better capital for each person employed and by pushing back technological frontiers . . . . The longer illegal immigration persists, the more low wages will be incorporated into the value of business assets and the longer entrepreneurs will ignore options for less labor-intensive forms of production."[43]

Some researchers see a negative relationship between immigration and employment as well as with wages. Economist Vernon Briggs concludes: "in the short run, it is likely that immigrants contribute to higher unemployment rates."[44] Former Secretary of Labor F. Ray Marshall declared to the Joint Economic Committee of Congress in 1986:

> "The relative openness of the American economy to immigration (legal and illegal) increases labor supplies relative to job growth and therefore reduces wages and perpetuates marginal low-wage jobs. Of course, it is impossible to know the number of illegal immigrants, but refugees and immigrants (legal and illegal) probably accounted for at least one-quarter of the growth in the American work force during the 1970s. There is some debate over the effects of immigration on employment, but there is little doubt in my mind that it depressed wages of U.S. residents, especially in the absence of policies to maintain economic growth."[45]

Ethnic enclaves and network recruitment. In establishing their place in the labor market, immigrants can take advantage of what sociologists Alejandro Portes and Robert Bach call "ethnic resilience."[46] This resilience promotes ethnic enclaves where a group's culture, identity, and internal solidarity are preserved. For such an enclave to emerge, there must be a sufficient number of immigrants of that ethnic group, sufficient sources of capital, and a sufficient supply of labor. Portes and Bach cite the Koreans of Los Angeles and Cubans of Miami as good examples. In these enclaves, newly arrived immigrants can thrive with scant knowledge of the host culture and language.

Philip Martin describes a similar process of "network recruitment" that works to the advantage of immigrants and disadvantage of native-born workers:

> "Immigrant workers displace American workers indirectly by getting hired in high turnover jobs and persisting as Americans quit. Pioneer migrants get promoted to supervisory positions with responsibility to recruit workers as vacancies arise, and these immigrant supervisors hire new workers through networks of friends and relatives that operate much more efficiently in Mexican villages than in American ghettos. The language of the workplace changes, and unemployed English-speaking workers are excluded from consideration for vacant jobs. Ethnic enclaves that exclude unemployed English-speakers have emerged in southwestern agriculture, construction, light manufacturing, and services."[47]

Recent Hispanic immigrants, both legal and illegal, have provided a pool of low-wage labor for agriculture and industry.

Studies of Asian immigrants, who now outnumber Hispanics among newly arrived legal immigrants, point to a very different picture from that described in research on legal and illegal Hispanic immigrant workers. Except for most post-Vietnam War Indochinese refugees, Asian immigrants in general, as noted earlier, are much better educated than Latin American immigrants, occupy higher rungs on the occupational ladder, and earn more.[48] Thus, their contributions to the U.S. economy are more likely to be positive.

Taxes and public services

Also a prime issue in the immigration debate is whether immigrants, particularly illegals, receive more in public services—education, health, welfare, unemployment and retirement benefits—than they pay back in taxes. Again there is no agreement.

The Council of Economic Advisors is convinced that their overall contribution is positive: "Aliens may also provide a net fiscal benefit to the nation, often paying more in taxes [federal and state income taxes and social security taxes withheld in pay checks, and sales taxes] than they use in public services."[49] The existing evidence, the Council claimed in its 1986 report, suggests that immigrants are not heavy users of public services, and illegal immigrants less so than legal immigrants because they are younger and have fewer dependents, "which reduces their eligibility for programs." Illegal aliens are also deterred from applying for welfare benefits by a system now being adopted by state and local governments, aided by the INS, to screen out illegal immigrants who are ineligible for government "entitlement" programs. However, the report admits that illegal aliens make "substantial" use of public health and education services "because of their easier access."

Public hospitals rarely check patients' immigrant status before providing services. Low-income illegal aliens will be entitled to Medicaid if a July 1986 New York district court ruling granting illegal aliens access to Medicaid is allowed to stand. A 1982 Supreme Court ruling in a case brought against the state of Texas now mandates that public elementary and high schools must accept illegal immigrant children, as in fact most states were doing voluntarily before 1982.

A 1983 INS study calculated that each one million illegal aliens in the U.S. costs federal, state, and local governments $2.25 billion a year in job displacement, police costs, education, welfare benefits, and unemployment insurance. To offset this, the taxes paid by illegal aliens were estimated to be $995 million per million illegal aliens, which results in a net annual government loss of $1.26 billion per million illegal aliens.[50]

These costs fall most heavily on the local and state governments where illegal aliens are most concentrated. For example, Los Angeles County's Department of Health reported in the summer of 1986 that the county had paid $14.8 million in medical obstetrical costs alone for illegal aliens during the fiscal year ending in June 1986 and that 76 percent of babies born in county public hospitals in that year were to illegal alien mothers.[51]

Again, it is important to note that such findings generally refer to Hispanic immigrants. Regarding Asians, a recent study found that "Data from the 1980 census indicate that Asian Americans are very little burden on state and federal public assistance resources,"[52] apart from post-Vietnam War Southeast Asian refugees, who have been heavily supported by government funds until they become established.

Immigrants and labor shortages

Some observers are concerned that the U.S. will be faced with a labor shortage in the coming decades if fertility remains low and argue that young foreign workers are needed to bolster the ranks of native-born newcomers to the work force that will shrink as the "baby bust" generation, born from the early 1970s onward, arrives at working ages in the 1990s.

Projections show that if fertility were to remain at 1.8 births per woman and there were no immigration, the total size of the U.S. work force would indeed decline after the year 2000. With the same low fertility but immigration of 1 million a year, the work force would continue growing and by 2080, more than 40 percent of workers would be immigrants or descendants of immigrants arriving after 1980.[53] To ensure a growing work force, it may well be necessary to admit a substantial number of immigrants.

Vernon Briggs argues against using

this as a reason to increase the ceiling on legal immigrants: "Let's wait to do that until that [labor] shortage happens . . . . There are all kinds of things that can happen, both on the supply and demand side. Maybe the labor force will contract, and maybe we shall need less labor in the future."[54]

Just such a scenario is posited by Gail Schwartz, author of *The Work Revolution* (1983):

> "In the future, the number of jobs which will be available . . . will change very radically. Technology will take away a great proportion of the relatively 'simple' jobs in manufacturing, office, and service work, in a way it has already changed warehousing. The actual, participating, active labor force will shrink."[55]

To sum up the questions on immigrants' impact on the U.S. economy, there appears to be agreement, albeit tentative, that legal immigration, particularly if it is funneled into the white-collar sector (as with much immigration from Asia), serves to produce more jobs for the overall economy. There is less agreement on the impact of illegal immigrants and the legal immigrants who fill service and low-skill labor jobs. Most research indicates little negative impact on native-born workers. This is not to deny the impact on individuals. As syndicated columnist William Raspberry wrote in the spring of 1986:

> "I find it difficult to believe that anybody interested in relieving unemployment among Americans, particularly American minorities, can believe that the influx of illegals suggested by 131,000 arrests in a single month does no harm to the job prospects of America's own jobless."[56]

There is more agreement that immigrants, particularly illegals, depress wages in low-wage enterprises. Some see this as a positive development. The arguments of the Urban Institute and Rand Corporation studies, that low-paid immigrant labor helps U.S. companies to ward off foreign competition, are valid, but this raises broader sociological issues. Does the U.S. want to preserve such low-wage occupations, leaving the door open to the revival of sweatshops, as is now happening in Los Angeles? Admittedly Americans benefit from low-cost agricultural, hotel, and restaurant services. But do we need a perpetual underclass to perform such services? Alternative ways can be found to preserve low-wage enterprises in more humane conditions.

The evidence is mixed on immigrants' use of public services versus the taxes they pay. For legal immigrants, the balance is probably no different from that of native-born Americans; over the years after arrival, their use of public schools and public services increases, but at the same time their incomes rise, so they pay more taxes. With illegal immigrants the balance sheet is probably negative and particularly in the local areas where they are most numerous.

Whatever the direction of employment in future years, an ever-growing proportion of the U.S. labor force will consist of recent immigrants and their children. The challenge will be, first, to assure a literate group of immigrants and then, to see how the new residents can best be trained to fit into the high-tech society of tomorrow.

Immigrants and assimilation

At the conclusion of *The Fourth Wave*, the authors observe: "Massive immigration from Mexico is contributing to an increasingly bilingual society in the Southwest . . . . It seems apparent that . . . noneconomic concerns, although rarely expressed, are uppermost in the minds of many Americans concerned about the consequences of immigration."[57]

With the rising tide of immigration, perhaps half of it from nearby Spanish-speaking countries, Americans are asking if the country has a right to expect that newcomers become "Americanized," or should we encourage a new cultural pluralism where each group might maintain its ethnic identity. The questions are not new.

As early as 1751, Benjamin Franklin wrote in dismay: "This [Pennsylvania] will in a few years become a German colony; instead of their learning our language, we must learn theirs, or live as in a foreign country."[58] By the early 19th century, writes sociologist Willi Paul Adams: "Newcomers found that their hosts harbored strong sentiments of national superiority; all were expected to leave the inferior Old World behind and, as Americans rather than as Europeans in exile, to join in building the New."[59]

The publication in 1908 of Israel Zangwill's play, *The Melting Pot,* focused attention on how and whether the increasing numbers of non-Anglo-Saxon "new immigrants" would adapt to American society. Restrictionists were adamantly opposed to the melting pot idea. Anthropologist Madison Grant wrote in 1916: "If the Melting Pot is allowed to boil without control, the type of native American of colonial descent will become as extinct as the Athenian in the Age of Pericles," and President Wilson declared: "A man who thinks of himself as belonging to a particular national group in America has not yet become an American."[60] Such sentiments gave birth to the "Americanization" movement which was designed to strip the immigrant of his native culture and attachments and make him over into an American along Anglo-Saxon lines.

Liberal intellectuals objected. Philosopher Horace Kallen proposed instead a cultural pluralism (a term he coined), arguing that the nation should "consciously allow and encourage its ethnic groups to develop democratically, each emphasizing its particular cultural heritage."[61] Such a view was clearly not appreciated in the 1920s, which saw the passage of the restrictive quota laws.

The issue of Anglo-conformity versus cultural pluralism faded as immigration dwindled during the 1930s and 1940s. Most immigrant groups eventually became acculturated into the mainstream of American life. But it took longer for some than others and researchers again began to examine the assimilation process.

Writing in the 1960s, sociologist Milton Gordon identified three types of assimilation: Anglo-conformity, melting pot, and cultural pluralism.[62] He divided the process of assimiliation into behavioral assimilation or acculturation—"the absorption of the cultural behavior of the host country"—and structural assimilation—"the entrance of the immigrants and their descendants into the general civic life of the receiving society." Gordon felt that acculturation had occurred for most U.S. immigrants but not structural assimilation, particularly for newer immigrants and racial minorities. Most immigrants might favor cultural pluralism but in reality it had never existed, he argued. Rather, immigrants, or at least their children, had been fully absorbed into the dominant Anglo culture.

These earlier theories of adaptation had little to say about blacks, Hispanics, and Asians, except to note their exclusion from the assimilation process. Now with the dramatic shifts in the sources of immigration since the 1960s, it is questioned how they apply to the current situation.

Writing in 1985, Portes and Bach agreed with Gordon that immigrant minorities, nonwhites and Hispanics, had not been structurally assimilated, that they had been rejected by the political and economic power structure.[63] But from this rejection they had developed an ethnic resilience, which binds together immigrants "who shared only the most tenuous linkages in the old country" in a culture that mingles the old-country culture with some aspects of American culture. Often this new pattern of adaptation gives rise to the ethnic enclaves noted earlier.

Will this be the adaptation pattern of today's and tomorrow's immigrants to the U.S.? The issue differs sharply from that of the turn of the century. At that time most immigrants were non-Hispanic whites and the country's population was under 100 million. Immigrants of the late 19th and early 20th centuries did speak "strange tongues" but their children and grandchildren spoke English and many climbed to starring roles in American society: governors, senators, captains of industry, entertainers, athletes.

Today there is concern over the apparent resistance of some of the newest Hispanic immigrants to learning English. Often cited are findings from surveys by Yankelovich, Skelly and White. Comparing 1984 to 1981, they found: "There is a significant increase in the desire to perpetuate Hispanic traditions through succeeding generations. There was no sign of increased commitment to mastery of English at the possible expense of Spanish. The commitment to Spanish is stronger, if anything."[64] Yet many persons of Hispanic background succeed in American society. Denver, San Antonio, and Miami have had Hispanic mayors, all second generation. The fears expressed by some may prove to be unfounded as future generations of Hispanics assimilate into the mainstream of American society.

Asian immigrants appear to be adapting fairly smoothly. Overall they are much better educated than Latin American immigrants and this holds true for the different groups of Asian Americans. Among adult males aged 25-29 in 1980, the percentages of Asian Americans (both immigrants and native-born) who had completed high school ranged from 96 percent for Japanese down to a low of 76 percent for Vietnamese. This compares with 87 percent for white males that age in 1980, 74 percent for blacks, and 58 percent for Hispanics.[65] Clearly, Asian Americans are helping to raise the overall educational level of the nation. Similarly, Asians, particularly Japanese, Filipinos, and Indians, are likely to speak English fairly well. Even among recent Korean, Chinese, and Vietnamese immigrants, well over half indicated in the 1980 census that they spoke English at least fairly well.

Citizenship, which confers the right to vote, is another indicator of assimilation and participation in American society. Over half of all foreign-born residents counted in the 1980 census were naturalized citizens, but only 29 percent of Latin Americans and 23 percent of the Mexican-born. John Garcia notes: "Consistently few Mexicans choose to become naturalized when they satisfy the eligibility requirements . . . . The average rate of naturalization is one-tenth of that of other immigrants' naturalization rates, and this pattern has not changed significantly over the years."[66]

An Hispanic schoolgirl. Some of the newest Hispanic immigrants appear committed to preserving their culture and the Spanish language, but many persons of Hispanic background have succeeded in American society.

There is another major difference between today's situation and that of immigrants arriving in the early decades of the 20th century. The quota laws of the 1920s, the depression, and World War II reduced immigration sharply until the 1960s. With few of their countrymen following them to the U.S., these immigrants and their children had time and incentive to assimilate into their new milieu. Such acculturation may take longer for today's immigrants with the continuing large additions to their numbers that are likely in future years, even if illegal immigration is curbed substantially.

Assimilation or Anglo-conformity versus cultural pluralism is now the issue. In recent testimony to the Joint Economic Committee of Congress, Governor Lamm argued forcefully for full assimilation:

> "America can accept additional immigrants, but we must be sure they become American. We can be a Joseph's coat of many nations, but we must be unified. We must have English as one of the common glues that hold us together. We should be color blind but not linguistically deaf . . . . We can teach English via bilingual education, but we should take great care not to become a bilingual society."[67]

Cruz Reynoso, the first Mexican-American appointee to the California Supreme Court, has voiced another opinion:

> "American is a *political* union—not a cultural, linguistic, religious or racial union . . . . Of course, we as individuals would urge all to learn English, for that is the language used by most Americans, as well as the language of the marketplace. But we should no more demand English-language skills for citizenship than we should demand uniformity of religion. That a person wants to become a citizen and will make a good citizen is more than enough."[68]

Will Anglo-conformity prevail anew with America's newest immigrants? Or will the melting pot prove to be appropriate, refined into the newer concept of a "salad bowl"—a blending and mixing of different ethnic and racial groups? Or will ethnic resilience be the adaptation process of the future, with ethnic enclaves and cultural pluralism mingled with immigrants who choose to assimilate to form a kaleidoscope, rather than a salad bowl?

And what will happen when no ethnic majority exists, as is already the case in Hawaii and will be in California and Texas soon after the turn of the century? Will "assimilation into" become "assimilation among," and how will the long-dominant "Anglo" community react?

It is time to ask: What kind of nation do we want in the 21st century? Yale University law professor Peter Schuck puts the question this way: "What are we? What do we wish to become? And most fundamentally, which individuals constitute the 'we' who shall decide these questions?"[69]

Immigration Law Reform: 1986

Of more immediate concern than immigrants' assimilation to most Americans is the problem of illegal immigration. There is sympathy for the plight of illegal immigrants, who are simply doing what humans have done for thousands of years—moving to better their lot in life. But the issues on the negative side of the ledger are mounting. The unquestionable right of a nation to have secure borders is being transgressed by these illegal acts. The illegality of these immigrants' status in the U.S. invites exploitation: Is the existence of such a subclass healthy, not only for the immigrants themselves but also for the nation? And there is the perception that soaring numbers of apprehensions of deportable aliens by the INS signal that the problem is getting out of hand (see "Illegal Immigrants," page 36). Although opinion differs on legal immigration—if and how much the annual ceiling should be raised—there is almost universal agreement that illegal movements into the U.S. must be reduced as much and as soon as possible, by a drastic overhaul of current immigration law. Immigration reform legislation has been proposed in each of the last three sessions of Congress, beginning in March 1982.

Congressional maneuvering: 1982-1986

As the 99th session of Congress drew to a close in the fall of 1986, efforts to achieve immigration reform legislation finally succeeded. The basic features of the reforms proposed in 1986 were presaged by the recommendations of the

Box 1. Illegal Immigrants: Definitions and Numbers

Who are they?

The very term "illegal immigrant" is subject to criticism. Sometimes the adjective used is less pejorative: "undocumented" or "clandestine." On occasion, "alien" replaces "immigrant." Some prefer the term "migrant," since many such movers remain only temporarily in the U.S. In this *Bulletin*, we generally use the commonly accepted term: illegal immigrant. The act itself is illegal, according to U.S. law, and although we do not know how many actually remain in the country, we consider crossing an international border to be immigration, not migration.

A 1985 National Research Council study conducted for the INS defines an illegal immigrant as "a noncitizen physically present in the United States who entered the country illegally and has not regularized his or her situation, or who has violated his or her terms of entry."[1] Entering the country illegally includes crossing the border "without inspection" or with fraudulent documents, such as falsified birth certificates or passports. Some 95 percent of INS apprehensions of "deportable aliens" are of persons attempting to cross the U.S.-Mexican border, because that is where the U.S. Border Patrol concentrates its forces. Illegal entries are also made across the U.S.-Canadian border and by persons arriving by air from Puerto Rico, who can escape inspection by mingling with Puerto Ricans who are U.S. citizens by virtue of Puerto Rico's commonwealth association with the U.S. About half of illegal immigrants in the U.S. are not illegal border crossers but "visa abusers": people who entered the country legally on temporary nonimmigrant visas but then overstayed the time limits of the visa or illegally took a job. Fraudulent marriages are also used to gain admission to the U.S. The INS estimated in 1986 that currently more than 30 percent of marriages between foreigners and U.S. citizens—which automatically makes the foreign spouse eligible for permanent resident status—are fraudulent.

An estimated 50 to 60 percent of illegal immigrants are Mexicans. Of the estimated 2.1 million illegal immigrants counted in the 1980 census, 55 percent were born in Mexico and another 22 percent were born in other Latin American countries.[2] However, illegal immigrants from 93 countries were apprehended by the INS in the early part of 1986 and the number of non-Hispanics entering through Mexico is mounting.

Census Bureau researchers distinguish illegal immigrants between "settlers," who come to the U.S. on a more or less permanent basis; "sojourners," who stay temporarily, such as seasonal farm workers; and "commuters," who cross the border daily. The impact of each group differs. Only settlers affect population growth; sojourners and commuters, as well as settlers, affect the labor market, but commuters are not likely to make use of social and health services. This *Bulletin* is mostly concerned with illegal immigrant settlers.

Traditionally, most illegal immigrants crossing the U.S.-Mexican border have been young adult males looking for work; many returned home regularly. In early 1986 the Border Patrol reported a 43 percent increase in family groups apprehended at the border, which suggests that an increasing proportion of illegal immigrants may be intending to remain permanently in the U.S.

How many?

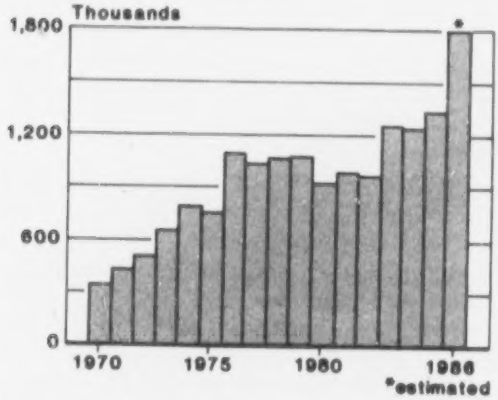
An honest answer to this question would be: "We simply don't know." Unfortunately, such an answer is seldom forthcoming, particularly from those who have a political, economic, or cultural interest in arguing for large (or small) numbers. Illegal immigrants are by definition undocumented. Any attempts to determine their numbers must rely on indirect, often circuitous, and even arcane methods. Efforts to estimate the "stock" of illegal immigrants—the number settled more or less permanently in the U.S. at a given time—are complicated by the fact that so many return to their homelands.

Estimates of this stock made during the early 1970s ranged from 1 million (INS estimate to House Subcommittee on Immigration and Naturalization, Illegal Alien Hearings, May 1972) to 8 million (Lesko Associates, September 1975, based on the Delphi method of asking experts what they thought the number was and averaging their replies). An INS report prepared for the House Subcommittee on Legal and Monetary Affairs (September 1974) gave a range of 4 to 12 million; the then INS Commissioner, Leonard S. Chapman, in a much-publicized remark, said he personally thought the range was 6 to 8 million. A 1980 Census Bureau review of all existing studies, prepared for the Select Commission on Immigration and Refugee Policy, arrived at a range of 3.5 to 6 million illegal immigrants residing in the U.S. as of 1978.

More recent studies have examined findings from the 1980 census. Census Bureau researcher Jeffrey Passel estimates that "at least" 2.057 million illegal immigrants were enumerated in that census.[3] From various surveys and speculations, he and other researchers arrive at a range of 2.5 to 3.5 million for the total illegal immigrant population as of 1980. The 1985 National Research Council study put the 1980 range at 1.5 to 3.5 million, and added: ". . . there is no empirical basis at present for the widespread belief that the illegal alien population has increased sharply in the late 1970s and early 1980s."[4] These estimates are at variance with Los Angeles County and INS officials' estimates that there were as many as 2 million illegal immigrants in that city alone in the early 1980s; with surveys that suggest that Texas may have 750,000 illegal immigrants; and with New York City Mayor Edward Koch's declaration that his city has at least 1 million.[5]

That the "stock" of illegal immigrants may have increased substantially since the 1980 census is suggested by indirect evidence on the "flow"—the number arriving each year. INS apprehensions of illegal immigrants numbered less than half a million a year in the early 1970s, rose to over a million in the late 1970s, and dropped slightly until 1983. Since then there has been a sharp rise, with a total of 1.8 million projected for fiscal year 1986, ending September 30, 1986 (see figure). Apprehensions are not an accurate count of the actual number of illegal immigrants entering each year, because the same persons may be apprehended more than once in a year, and the rise partly reflects increased Border Patrol coverage. However, the entire 2,000-mile U.S.-Mexican border still had only 2,600 agents at the end of 1985 and agents reported that the numbers of persons seeking to enter the U.S. during 1986 had indeed surged—apparently driven by Mexico's mounting economic troubles and demographic pressures. INS officials estimate that for every illegal immigrant apprehended, two to three go undetected.

Apprehensions of Illegal Immigrants: Fiscal Years 1970-1986



Source: Immigration and Naturalization Service

INS apprehensions of illegal immigrants crossing the U.S.-Mexican border have gone up sharply in recent years.

Passel estimates that the *net* increase in the "settled" immigrant population was 100,000 to 300,000 a year between 1980 and 1983, based on a comparison of findings from the Census Bureau's April 1983 Current Population Survey with estimates of illegal immigrants counted in the 1980 census. The 1986 INS estimate of net annual increase is 500,000—an "educated guess" based on Border Patrol experience that might go higher when the year's total experience has been reviewed.

With such an uncountable population, "educated guesses" based on observation may be worth as much as estimates based on even the most sophisticated techniques of analysis. When one witnesses the nightly confrontations between U.S. Border Patrol agents and would-be illegal immigrants at places like San Ysidro, California, across from Tijuana, Mexico, and when one sees the miles of Hispanic ghettos throughout Los Angeles county, the conclusion has to be that we simply do not know how many illegal immigrants there are in the U.S. and how many more come each year. Suffice it to say that the number is large and growing.

Where are they?

Since 77 percent of illegal immigrants counted in the 1980 census were born in Latin America, it is not surprising that they tended to be living in the states with the heaviest concentrations of all Hispanics and of all immigrants born in Latin America who were enumerated in the census (see page 20). Almost half lived in California, and another 31 percent in New York, Texas, Illinois, and Florida. But more than other groups in the U.S., illegal immigrants appear to be concentrated in a few metropolitan areas, and especially Los Angeles. Los Angeles contained one-third (658,000) of all illegal immigrants counted in the 1980 census, and relatively large numbers were also found in New York City (212,000) and Chicago (127,000). The census did not enumerate large numbers of illegal immigrants in the border cities of Texas. These cities apparently have large numbers of illegal workers, but they move back and forth across the border and are not settled enough to be enumerated in a U.S. census.

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2. Passel, Jeffrey S., "Immigration to the United States," text of speech delivered at Census Table, Honolulu, Hawaii, August 1986.
3. *Ibid.*, p. 21.
4. Levine, Hill, and Warren, *Immigration Statistics*, p. 243.
5. Lamm, Gov. Richard D. and Gary Imhoff, *The Immigration Time Bomb* (New York: Dutton, 1985) p. 15.

Select Commission on Immigration and Refugee Policy, created by Congress in 1978. Following the issuance of the Commission's recommendations in March 1981, the Reagan administration set up a task force which proposed an immigration reform package somewhat narrower than the Commission's suggestions but including two of its key provisions: penalties or "sanctions" for employers who knowingly hire illegal immigrants and legalization or "amnesty" for illegal immigrants already in the U.S.

An administration bill went nowhere and was dropped when in March 1982, the first version of the so-called Simpson-Mazzoli bill (Immigration Reform and Control Act of 1982) was introduced in both houses of Congress. Important provisions of this bill included amnesty, sanctions, a temporary worker program, and an annual ceiling of 425,000 on nonrefugee immigration. Thus began the still unfinished saga of immigration reform legislation.

The Simpson-Mazzoli bill was passed by the Senate, 80-19, in August 1982, but died in the House in December, with many amendments clinging to it. The measure was reintroduced in the 98th Congress in March 1983 and again passed the Senate by an overwhelming margin, 76-18, in May. The House Judiciary Committee passed the House version in May as well, but over a year passed before it was considered by the full House.

In June 1984 the bill squeaked by the House, 216-211, but there were at least 117 conflicts between the House version and the earlier Senate version. The 98th Congress adjourned in October 1984 with the immigration bill still being argued in a conference committee. Among the snags were an amendment prohibiting employment discrimination on the basis of citizenship and a proposed $4 billion cap on federal reimbursement to states for costs associated with amnesty.

In 1985 this phoenix legislation was again introduced in both houses of Congress: May in the Senate and November in the House. Simpson was again the Senate sponsor, but Mazzoli yielded to Congressman Peter Rodino (D-New Jersey) in sponsoring the bill on the House side. The Senate passed the bill in September 1985 and the House Judiciary Committee voted out a House version in the summer of 1986. Chances for the bill's enactment by the 99th Congress appeared dead when the House balked a controversial guestworker provision and refused to bring the bill to the floor for debate, but last-minute efforts revived it, and both the House and Senate passed reform legislation during the final days of the session.

Immigration Reform: 1986

Reform legislation passed in 1986 contains three central provisions proposed in earlier versions: employer sanctions, legalization (amnesty), and temporary agricultural workers. Provisions were also made for state and local costs of legalization and for the investigation of claims about discrimination against aliens.

Employer sanctions. The new law makes it illegal for an employer knowingly to hire an alien not authorized to work in the U.S. Large as well as small employers (e.g. households hiring domestic workers) will be required to verify new hires by examining either a U.S. passport or a combination of a birth certificate or Social Security card with either a driver's license, a state-issued I.D. card, or an alien identification document commonly referred to as a "green card."

After a six-month education period and 12 months when warning citations would be given, employers convicted of hiring violations would face civil penalties including fines ranging from $250 to $10,000 and prison terms depending on the number and persistence of offenses.

The new law eliminates the Texas Proviso and thus reduces what is seen as the single major "pull" factor for illegal immigrants: the probability of employment at much higher wages than obtainable in their less developed home countries. The method of ascertaining legal status falls short of establishing a national identity document. Sanctions were opposed by Hispanic groups on the grounds that the identification requirement would lead to discrimination against them by employers who would simply not hire any Hispanics rather than risk penalties. The new law establishes a special office at the Justice Department to investigate such discrimination.

Amnesty. Aliens who entered the U.S. illegally before January 1, 1982 will be granted temporary resident status. They can apply to become permanent resident aliens after 18 months and can apply for citizenship five years later. However, they will not be eligible for federally funded benefits—including welfare benefits—for five years.

The purpose of amnesty is to recognize an accomplished fact: that there are many illegal immigrants in the U.S. who have lived here a long time and become well established. To deport such a large group would be impossible and to many Americans it seems untenable to continue to countenance a large population living in this country as a subclass outside the protection of the law. Opponents of amnesty argue that it would only lure more illegal immigrants, hopeful that amnesty would be declared again in the future.

Agricultural workers. Aliens who worked at least 90 days in U.S. agriculture between May 1, 1985, and May 1986, will be given temporary resident status. After two years, those aliens would become permanent residents.

Also, aliens who can prove they worked 90 days a year in U.S. agriculture for the last three years would qualify for permanent resident status after one year.

If the program does not attract enough labor to satisfy U.S. agricultural needs, the government could approve the entry of "replenishment" workers, who would become eligible for temporary residence if they work in agriculture for three years. Farm workers would qualify for permanent legal status after the three years.

The H2 program under which foreign agricultural workers are brought in temporarily by the Labor Department for seasonal work would be simplified. H2 workers would be allowed to receive free legal assistance for work-related matters, including employer-provided housing, working conditions and contract disputes. Opponents say the provision would still permit continued exploitation of farm labor and that American citizens and legal residents would gladly do the work if it were fairly paid. Other commenators argue that the continued existence of a large supply of cheap labor would deter some American farmers from mechanizing and would eventually make them less and less competitive on the world market.

Implications of legislation reform

What are the likely implications for American society of the reform legislation passed in 1986?

Proponents of sanctions say that illegal immigration will be curbed sharply. If net illegal immigration currently numbers up to 300,000 a year, as conservatively estimated, a large proportion of total actual immigration would be eliminated. Since Hispanics make up the majority of illegal immigrants, the Hispanic component of total (illegal plus legal) immigration would shrink. Other impacts of illegal immigration, both positive and negative, would be eliminated as well. For example, southern California's job market would change radically as its large pool of low-paid illegal workers dried up. Of course, sanctions may not be effective. Implementation could be difficult or impossible. Or discrimination might be so rampant that the sanctions would be abandoned.

Amnesty would alleviate but not eradicate a cancer in American society. There is no guarantee that all eligible illegal aliens will register for legalization. And amnesty will be a one-shot event; recent and future illegal immigrants would be ineligible and hence a new underclass would already be formed and growing.

The guestworker provision may work more to maintain the status quo than to induce change. Agricultural employers will still have a cheap supply of labor. And many very recently arrived illegal immigrants will be rapidly set on the road to citizenship—a situation that outrages opponents of this provision.

Overall, if everything were to work as planned, illegal and hence total immigration would drop, an underclass would be eliminated, and agricultural interests would be protected.

The new law is only a partial overhaul of immigration legislation. The 1986 law says almost nothing about *legal* immigration, which many feel needs to be reexamined. In fact, the House has already begun considering such changes.

Sure to be hotly debated in the next year or two is a proposed change regarding the numbers of legal immigrants admitted. The current ceiling is 270,000 a year. But spouses, children, and parents of U.S. citizens, who are allowed to enter outside this limit, and refugees and approved asylees adjusting to permanent resident status, who are also not counted in the quota, have brought the total up to more than twice this number in recent years: 560,000 in fiscal year 1983, 544,000 in 1984, and 570,000 in 1985. (The INS reports that the 21,000 increase in immediate relatives admitted between 1984 and 1985, from 183,247 to 204,368, was the largest annual increase since the end of World War II and was probably related to the recent sharp upturn in permanent resident aliens becoming naturalized citizens—as they may do after five years—and thus eligible to bring in immediate relatives without restrictions. In fiscal year 1985, 95,040 refugees and approved asylees adjusted to permanent resident status.[70]) Legal immigration numbers are thus in a sense

Box 2. Refugees and Asylees

Legislation and numbers

Before World War II, refugees were accorded no special place in U.S. immigration law. As a result, the only possible path to admission to this country for those fleeing oppression in Europe in the late 1930s was through normal immigration procedures under the national quotas set by the 1924 National Origins Act. This effectively barred most people seeking refuge as World War II loomed.

Refugees were not given formal status in immigration law until the 1965 amendments to the 1952 immigration act. However, beginning after World War II, numerous refugees were admitted under ad hoc measures: special legislation passed by Congress or executive actions by the President or the Attorney General. In 1945, for example, President Truman directed that 40,000 displaced persons be admitted under existing quotas. Legislation of 1948, 1950, and 1951 allowed many more displaced persons to immigrate.

The 1952 act did not mention refugees but did establish the class of parolees, whereby the Attorney General could allow individuals to enter the country "for emergent reasons or for reasons deemed strictly in the public interest." This approach proved to be the most flexible way to deal with refugee flows until the Refugee Act of 1980. (Parole authority still exists, but is now used to admit people for a limited time for "emergency" reasons, such as obtaining medical care.) Parole authority was used to admit the waves of refugees fleeing Hungary after the Russian-suppressed uprising of 1956, Cubans who fled after Castro's takeover in 1959, and the majority of Indochinese refugees arriving after the end of the Vietnam War in 1975 (see table).

In the 1965 legislation, refugees were explicitly recognized for the first time. The seventh preference category (6 percent of numerically limited admissions) was reserved for refugees from communist countries or communist-dominated countries or the general area of the Middle East. This narrow definition of refugees remained until 1980. Refugees admitted under the 1965 provisions were given conditional entry; they had to wait two years to receive immigrant (permanent resident) status. By 1980 some 130,000 refugees had been admitted by this route.

The Refugee Act of 1980 was an attempt to solve the problem of refugee admissions once and for all. The definition of refugee was broadened to conform with United Nations guidelines: persons suffering persecution or with a well-founded fear of persecution because of political opinion, membership in a particular social group, race, ethnicity, nativity, or religion. Refugee numbers were removed from the overall immigrant quota (which was then reduced to 280,000 in 1980 and 270,000 thereafter) and were to be determined yearly by the President in consultation with Congress. The quo-

Refugees Arriving in the U.S.: 1956-1985

Years	Source of refugees and type of admission	Number
	Admitted under parole authority	
1956	East European orphans	925
1956-57	Hungarians	38,045
1960-65	East European escapees (Fair Share Refugee Law) NB	19,754
1962	Chinese from Hong Kong and Macau	14,741
1962-79	Cubans, initially by individual flight, after 1965 by regular airlift	692,219
1963	Russian Old Believers from Turkey	200
1972-73	Ugandan Asians	1,500
1973-79	Soviet Union (mostly Jews)	35,758
1975-79	Indochinese in ten separate parole programs NB	ca. 400,000
1975-77	Chileans	1,400
1976-77	Chileans, Bolivians, Uruguayans	343
1978-79	Lebanese	1,000
1979	Cuban prisoners	15,000
1980	Refugees, all sources	110,868
1968-80	Refugees admitted under seventh preference of 1965 immigration law NB	ca. 130,000
1980	Cuban-Haitian special entrants	140,000
	Admitted under 1980 Refugee Act	
1981	Refugees, all sources	155,291
	Asylees approved	1,175
1982	Refugees, all sources	93,252
	Asylees approved	4,731
1983	Refugees, all sources	57,064
	Asylees approved	8,333
1984	Refugees, all sources	67,750
	Asylees approved	11,627
1985	Refugees, all sources	62,4777
	Asylees approved	6,514

Sources: Barry N. Stein, *Migration News*, No. 2, 1986; Immigration and Naturalization Service, Statistical Branch tas have ranged from 168,000 in fiscal year 1981 down to 70,000 in fiscal 1985 and 67,000 in fiscal 1986. The numbers actually arriving in the U.S. since 1980 have not quite equaled the annual quotas (see table). Refugees are eligible to adjust to permanent resident status after one year in the U.S.; 87,000 did so in fiscal 1984 and 90,000 in fiscal 1985. These adjustments also come outside the annual 270,000 immigrant quota but are counted in the INS annual totals of legal immigrants admitted. (These totals do not include refugees when they first arrive.)

The 1980 Refugee Act also established for the first time an asylee category. Like refugees, asylees are defined as persons who fear persecution if forced to return to their homeland, but unlike refugees, they are already in the U.S. The limit on asylee approvals was set at 5,000 a year, but the number actually approved was more than double that in fiscal 1984 (11,600) and 6,500 in fiscal 1985 (see table). Asylees may also adjust to permanent resident status one year after they are approved; these adjustments were 5,600 in fiscal 1984 and 5,000 in fiscal 1985.

The design of the 1980 act was based on experience with the most recent large flow of refugees, those from Indochina. These refugees had been in countries of first asylum before coming to the U.S. There was no adequate provision for the sudden influx of 125,000 Cubans in the Mariel boatlift that began in April 1980, the month the act took effect. Boatloads of Cubans—and Haitians as well—arrived daily in the U.S. and there was no first country of asylum. Because the 1980 act authorized the President to admit refugees above the numerical limit and to waive the country-of-first-asylum provision, these refugees were accommodated, but not without great problems and much acrimony. The federal government ultimately decided that these arrivals were not formally refugees and created a special category for them: "Cuban-Haitian Entrant (Status Pending)." The Mariel boatlift Cubans became eligible to adjust to permanent resident status beginning July 1985 (except for the 2,500 or more discovered to be criminals, who remain in detention, and other misfits).

The appearance of the Haitians was just one example of what has become an important issue relating to asylees: economic versus political motivations for coming to the U.S. The government feels it must make a distinction between these two and turn down requests for asylum from people it considers to be economically motivated. Otherwise, it claims, our borders would be flooded with people wanting to enter to improve their lives economically and trying to circumvent the usual preference system of immigration. The sanctuary movement, which has sprung up in reaction to government denial of asylum, claims that the rules of asylum are being applied selectively, with asylees from governments the U.S. officially supports (El Salvador, Guatemala) not being accepted, while those from governments the U.S. officially opposes (Nicaragua) are welcomed.

In the case of refugees, the U.S. government can choose whom to admit from among numbers far larger than the current quota of 67,000. (Worldwide estimates of refugees currently in countries of first asylum range upward from 8 million.) However, the patterns of potential refugee movements to the U.S. are somewhat out of the govenment's control, being the product of political situations in many countries around the world. There is no sure way to predict when and from where the next large flow might erupt. No law can be devised which can deal adequately with the many different problems that refugee immigration presents for the U.S.

The sudden influx of Cuban Mariel boatlift people, combined with the crest of the wave of post-Vietnam Southeast Asian refugees, pushed the refugee arrival total for 1980 well over 200,000, as seen in Figure 4 (page 44). Thus, 1980 stands out as the peak year for legal immigration in recent years, with just under 800,000 admissions. (These annual "gross" immigration numbers, illustrated in Figure 4, count refugees only in the year they arrived and asylees in the year they were approved, and omit previously arrived refugees and asylees who are adjusting to immigrant status in a given year.) Since 1980 the combined refugee and asylee totals, and hence the overall "gross" legal immigration totals, have declined. The number of newly arriving Vietnamese and Laotian refugees has gone down, although arrivals of refugees from Kampuchea have increased. There has also been some increase in refugees from Ethiopia, Iran, Poland, and Romania.

A Laotian refugee learns English.

Adjustment in the U.S.

Refugees, as noted earlier, are prime examples of people "pushed" to migrate and thus tend to be negatively selected. This was markedly true of Southeast Asian refugees arriving after 1978. Unlike the highly educated, highly skilled and urbanized other recent Asian immigrants, these refugees arrived as mostly uneducated farmers, fisherfolk, and laborers, speaking little or no English and with no family members already in the U.S. to help in their adjustment. They have faced many problems: in housing, health, education, and finding jobs. However, various studies have shown that with time and increasing mastery of English, Indochinese refugees achieve labor force participation and unemployment rates similar to the general U.S. population and the proportion living in poverty and/or dependent on welfare declines.

The first wave of Indochinese refugees to arrive, from 1975 to 1977, were relatively well educated and most had been in white-collar occupations in their home countries, so their adjustment has been easier. This was true also of Cuban refugees arriving during the 1960s and early 1970s, many of whom have flourished in professions and business, chiefly in Florida. The Mariel boatlift Cubans arriving in 1980, like the second wave of Indochinese refugees, had much less "human capital" to help them in their search for jobs and economic adjustment. Also, many of the 1980 Cuban refugees were criminals who still languish in jails or have caused many problems in the communities where they have settled.

Beginning with Cuban refugees in the early 1960s, the U.S. government has provided full help to refugees until they achieve self-sufficiency. (Before this, the private sector had to provide any help refugees received, and, indeed, such help had to be guaranteed before refugees were admitted.) Refugee resettlement programs include income and medical support, English lessons, help in finding jobs, and education.

Some Indochinese refugee groups have had stormy times in the communities where they have settled. Long-time residents have greeted them with resentment, suspicion, and harrassment, ranging in seriousness from anti-Asian bumper stickers to violence. The refugee groups appear to be victims in part of a widespread pattern of activity against Asians in general, documented in a just-published report of the Commission on Civil Rights.[1] However, the clash between cultures has been particularly sharp with some refugee groups, such as Hmong tribespeople and Vietnamese fishermen. Southeastern Asian refugees are also handicapped by the legacy of the traumatic experiences many of them had before arriving in the U.S. But with time, studies show, these refugeees are accepted as established groups within the community as they find jobs, pay taxes, and start businesses.

The impact of refugees on a community has been most marked in Miami, which has been reshaped politically, economically, and culturally by the Cuban refugees of the 1960s and 1970s—and often troubled by the Marielitos of 1980.

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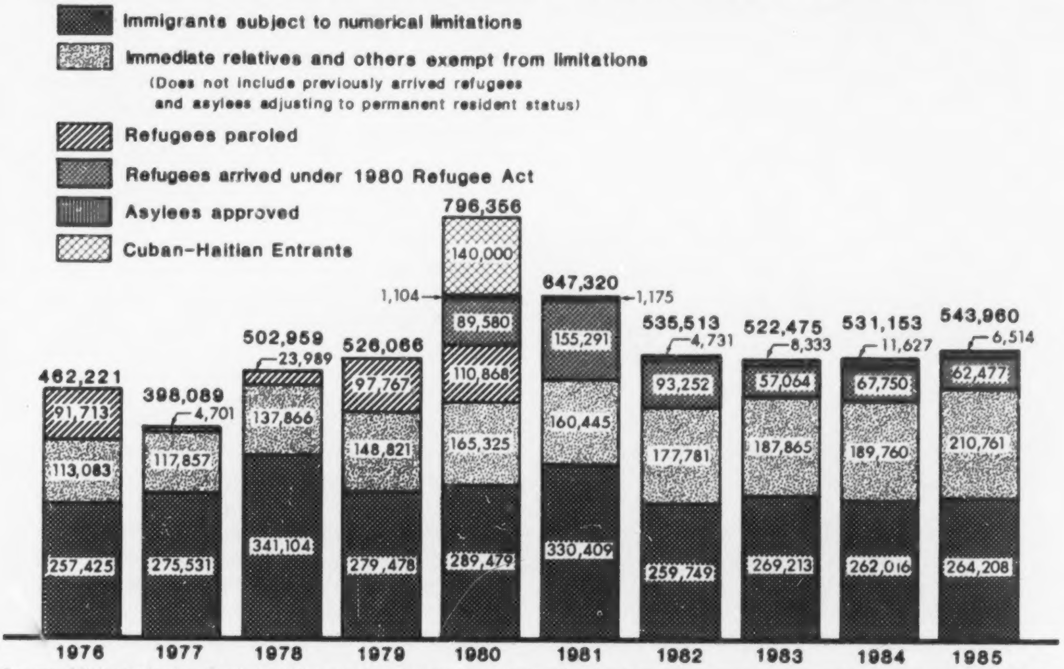
[1] U.S. Commission on Civil Rights, *Recent Activity Against Citizens and Residents of Asian Descent* (Washington, D.C. 1986)

"uncontrolled," and there is pressure to put a cap on all immigration of whatever kind. If this were enacted into law, legal immigration would undoubtedly go down, unless of course the ceiling were put higher than 570,000. If every country was

Figure 4. Gross Legal Immigration: Fiscal Years 1976-1985



Source: Michael Hoefer, Statistical Branch, Immigration and Naturalization Service, personal communication, September 1986.

Note: For a given year, "gross" immigration includes legal permanent residents arriving in the U.S. who were issued visas overseas, those who arrived in prior years as temporary visitors and who are adjusting their status to legal permanent resident (other than refugees), refugees on initial arrival and asylees when their status is approved.

Immigrants subject to numerical limitations: Includes Recaptured Cuban Numbers issued above the worldwide limitation in Fiscal Years 1978-1983. Excludes Cuban refugees adjusting to immigrant status in Fiscal Years 1976-1977.

Immediate relatives and others exempt from numerical limitations: Excludes refugee and asylee adjustments to permanent resident status.

Refugees paroled: Includes all parolee arrivals.

Asylees approved: Asylees when their status is approved under the 1980 Refugee Act. These asylees have usually entered the U.S. in prior years.

Cuban-Haitian Entrants: The estimated number of Cubans who entered the U.S. illegally between April 15, 1980, and October 10, 1980, and Haitians who entered the country illegally prior to January 1, 1981.

actually limited to the now theoretical per-country limit of 20,000 a year, numbers would be sharply reduced for countries currently sending numbers well above that: for example, Mexico, the Philippines, and Korea, which topped the country list of legal immigrants admitted in 1985, with 61,000, 48,000, and 35,000, respectively.

There is also a proposal to eliminate the fifth category of the current preference system, covering siblings of U.S. citizens. So many people have used this category that the 1965 law has been dubbed the "Brothers and Sisters Act." Removing this preference would put an end to the chain migration of large extended families that it fosters. In the absence of other changes, this would remove a whole category of potential immigrants. This could reduce immigration from countries where the fifth preference allotment is now completely subscribed, though applicants under other preferences might take up the slack.

Less likely to be enacted is a proposed deemphasis on family reunification in favor of more emphasis on occupational qualifications. Even more difficult to achieve would be agreement on a flexible quota to be changed annually to suit the needs of the labor market. Canada and Australia have such quotas, but their immigration is administered by commissions with fairly broad discretionary powers. Such a system is not likely to be acceptable in the U.S.

Putting more emphasis on labor qualifications might have the desired effect of matching the size and composition of immigration flows more closely to the needs of the labor market. It would also allow the entry of "new seed" immigrants, those now barred because they have no relatives in the U.S. and so few places are available for immigrants with occupational qualifications.

The Outlook

Even with immigration reform, outside pressures to migrate to the U.S. are only likely to increase. Labor force growth outstrips job supplies and population growth remains high in most leading countries of origin. In the Philippines, for example, fertility is still well over four births per woman and population growth is 2.5 percent a year (which doubles a population's numbers in 28 years).

Dramatic growth is projected for the population of many countries closer to the U.S. In a forthcoming report, the Center for Immigration Studies projects that between 1980 and 2010, overall population will double—from 166 to 340 million—in the countries of the Caribbean Basin (Mexico, Central America, the Caribbean island states, and the littoral nations of Colombia, Venezuela, and Guyana).[71] That growth will be concentrated in the age groups of young adults entering the labor force. Just to keep a lid on the already unacceptably high unemployment rates, 35 million additional jobs would have to be created between 1986 and 2000 to balance the projected increase in the labor force. "If levels of unemployment and underemployment are to diminish, and if the trend toward higher labor force participation rates persists, then even more jobs will have to be created," the report observes. The amount of additional investment needed by 2000 to keep job supply from falling further behind labor supply in the region is estimated to be one trillion dollars, more than half of it in Mexico.[72] The challenge for these nations is overwhelming. Inevitably, out of sheer desperation, vast numbers of their residents will make their way northward in search of work.

By legal or illegal means, immigration to the U.S. is likely to continue for the foreseeable future. Whether the numbers will decline somewhat remains to be seen. The nation must be realistic, and reasonable people of different views will need to confer on how best to cope with the major changes this might imply for American life styles.

At the turn of the 20th century when the "new immigrants" from southern and eastern Europe were gaining on the long-dominant white Anglo-Saxon Protestant group, Madison Grant mourned "The Passing of the Great Race":

> "The new immigration contained a large and increasing number of the weak, the broken and the mentally crippled of all races drawn from the lowest stratum of the Mediterranean basin and the Balkans, together with hordes of the wretched, submerged populations of the Polish Ghettos . . . . It is evident that in large sections of the country the native American will entirely disappear. He will not intermarry with inferior races and he cannot compete in the sweat shop and in the street trench with the newcomers."[73]

Today's new immigrants from Latin America and Asia rarely meet with such racist sentiments. It is recognized that the nation has benefited greatly from the influx of people from eastern and southern Europe, as well as the later arrivals from Asia and Latin America. The number of Americans of foreign birth who have enriched this society is imposing: from Albert Einstein to Elizabeth Taylor to Rod Carew. The United States is far better for having remained a "nation of immigrants."

Still heard from time to time are extreme views—from restrictionists on the one hand to open-border advocates on the other. The Ku Klux Klan has found in the immigrant a new scapegoat to blame for the country's economic and social ills. Other groups have even taken up arms illegally to combat illegal immigration. At the other extreme, some Latino groups argue for the return of the territory "stolen" from Mexico in the unfortunate War of 1847, by demographic means if necessary.

But these are exceptions. On the whole, protagonists in the current debate on immigration argue their positions on the basis of American economic and social interests and humanitarian concerns for immigrants. Very few people advocate a total end to legal immigration; however, there is much disagreement on the number to be admitted. Public opinion favors restricting illegal immigration, though disagreement remains on the means to be taken.

Some people are concerned over the apparent tendency of certain immigrant groups to maintain their own language and culture, showing little interest in becoming "Americanized," through naturalization or otherwise. Other observers see this as a passing phase and anticipate that the next generations—like the descendants of earlier immigrants—will gradually assimilate in one way or another into American society.

One thing is clear: The nation's ethnic composition is again changing dramatically. This is an opportunity and a challenge. As one writer puts it:

> "America is a country that endlessly reinvents itself, working the alchemy that turns 'them' into 'us.' That is the American secret: motion, new combinations, absorption. The process is wasteful, dangerous, messy, sometimes tragic. It is also inspiring."[74]

That process will be continuing as the United States enters the 21st century. *Time* Senior Editor Henry Muller recently summed it up: "No other country has the courage to let its demographic mix change so quickly, and to bet that doing so will continue to enrich it."[75] ☐

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POPULATION BULLETIN
Vol. 42, No. 1, March 1987

Europe's Second Demographic Transition

By Dirk J. van de Kaa

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Abstract—By 1985, fertility rates in Europe were below the replacement level of 2.1 births per woman in all but Albania, Ireland, Malta, Poland, and Turkey, following a steady decline from a 1965 postwar peak well above 2.5 in Northern, Western, and Southern Europe and an erratic trend from a lower level in Eastern Europe. Natural decrease (fewer births than deaths) had begun already in Austria, Denmark, Hungary, and the Federal Republic of Germany and can be expected shortly in many other countries. According to current United Nations medium projections, Europe's population (minus the USSR) will grow only 6 percent between 1985 and 2025, from 492 to 524 million, and 18.4 percent of the population in 2025 will be 65 and over. The decline to low fertility in the 1930s during Europe's first demographic transition was propelled by a concern for family and offspring. Behind the second transition is a dramatic shift in norms toward progressiveness and individualism, which is moving Europeans away from marriage and parenthood. Cohabitation and out-of-wedlock fertility are increasingly acceptable; having a child is more and more a deliberate choice made to achieve greater self-fulfillment. Many Europeans view population decline and aging as threats to national influence and the welfare state. However, governments outside Eastern Europe, except for France, have hesitated to try politically risky and costly economic pronatalist incentives. As used in Eastern Europe, coupled with some restrictions on legal abortion, such incentives have not managed to boost fertility back up to replacement level. Immigration as a solution is unfeasible. All countries of immigration have now imposed strict controls, tried to stimulate return migration of guestworkers recruited during labor shortages of the 1960s and early 1970s, and now aim at rapid integration of minorities. Only measures compatible with the shift to individualism might slow or reverse the fertility decline, but a rebound to replacement level seems unlikely and long-term population decline appears inevitable for most of Europe.

Editor: Jean van der Tak

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Europe's Second Demographic Transition

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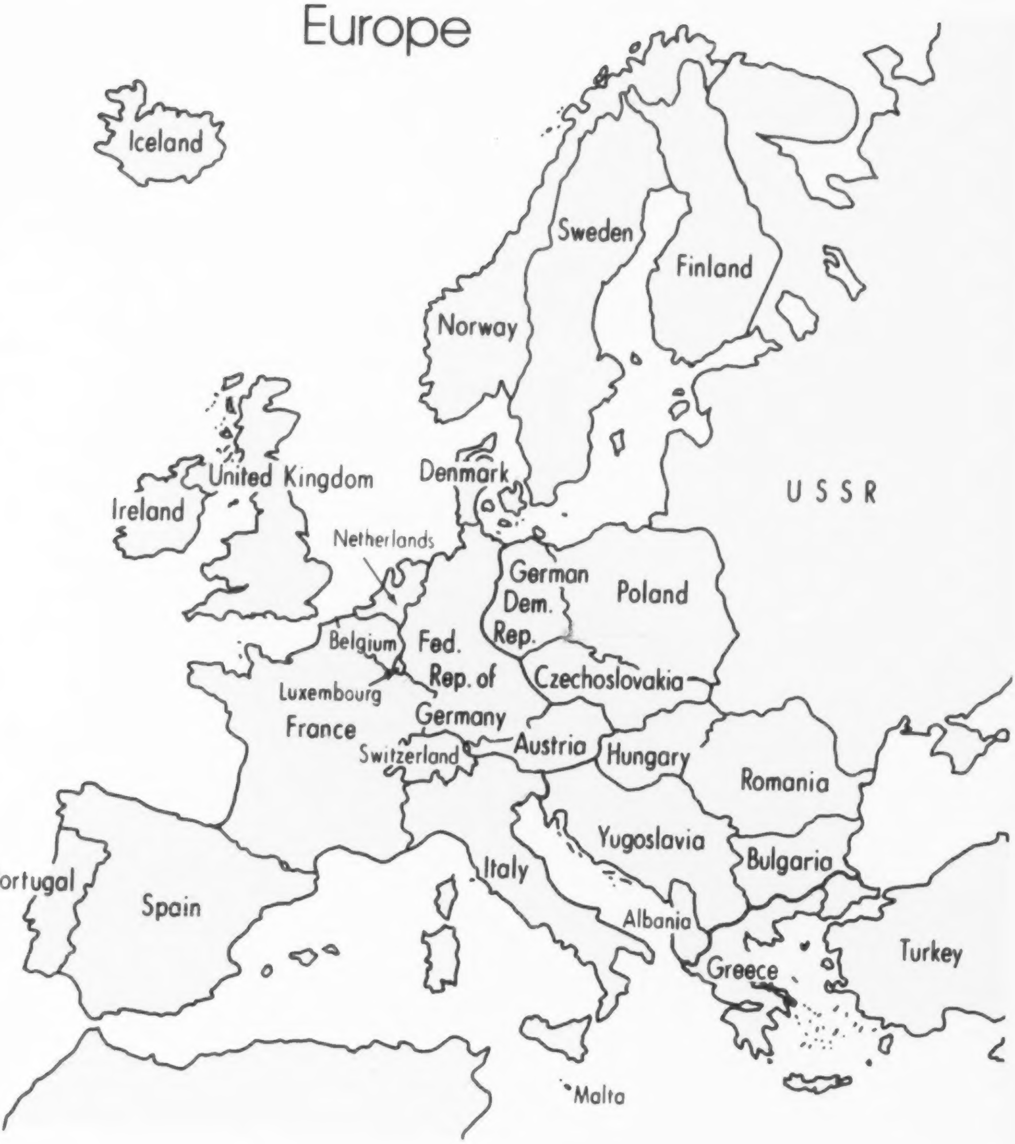
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Europe's Second Demographic Transition

By **Dirk J. van de Kaa**

Dirk van de Kaa is director of the Netherlands Institute for Advanced Study in the Humanities and Social Sciences (NIAS) and was the first director (1971 through 1986) of the Netherlands Interuniversity Demographic Institute (NIDI). Among his other positions, he is professor of demography at the University of Amsterdam, president of the European Association for Population Studies, member of the United Nations Population Commission, and was project director of the World Fertility Survey (1981-1982) and director of the International Statistical Research Centre (1982-1984). He holds the Ph.D. in demography from the Australian National University and is author or editor of numerous publications on a wide variety of demographic topics.

For their help in the preparation of this Bulletin, *Dr. van de Kaa is grateful to Jacqueline Brieër, Harry Bronsema, Martijn Jonker, Maarten Leopold, and Frans van Poppel of NIDI for research assistance, Mariette van Woensel for secretarial help, Gérard Calot and Alain Monnier for special data, and particularly to Ron Lesthaeghe and Hans-Joachim Hoffmann-Nowotny for stimulating discussions about issues dealt with in the* Bulletin.

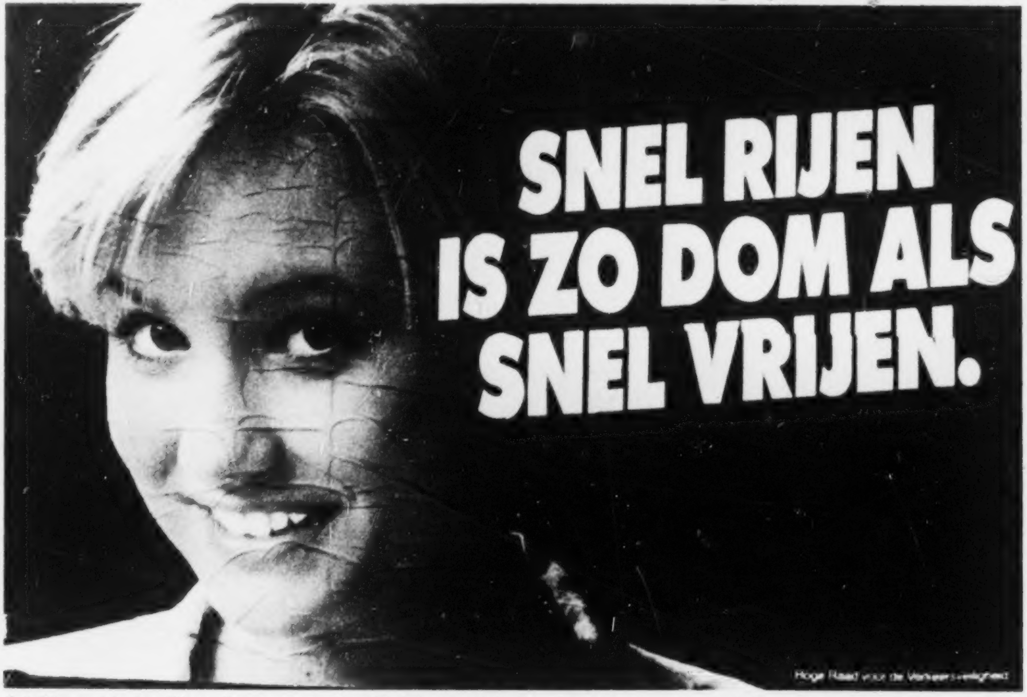
Last summer, like many Dutch people heading for holidays in the south of France or Spain or Portugal, I drove through Belgium. Just across the border a large billboard caught my eye. It showed an attractive girl and a slogan that a Dutchman would translate as "Driving fast is as stupid as making love fast" (see photo, Figure 1, page 4).

I was so surprised I nearly drove off the road. Who in the world thought of that?, I asked myself. Who went along with the idea and put up these posters along the highway? Who was the girl and is that how women look when they want to convey such a message? And, finally, how could this happen in Belgium, of all places?

Since then I've learned that the posters were put up by the Belgian High Council for Traffic Safety and aimed at adolescents with the sensible message: Is it really wise to see fast driving as a demonstration of virility? I read somewhere that the girl's name is Nicky, that she is not Belgian but a native of Texas, and has returned there. But I have no clearcut answer to the question I find most intriguing: How could this happen in Belgium.

For that poster did not fit with my view of Belgian society. Historically, and probably still today, Belgian public life and politics have been dominated by the "language problem"—the competition between its French-speaking and Dutch-speaking groups—and by powerful, center-right religiously inspired political parties. At international meetings, representatives of the Belgian government are almost invariably conservative on matters dealing with the family, sex, or contraception. Unlike most of the rest of Europe, Belgium has not legalized abortion. The legal status of sterilization is unclear and advertising of contraceptives is still prohibited. In 1971, in his second national survey of fertility and family planning, Belgian socio-biologist Robert Cliquet found that more than half of married women aged 30-34 using contraception were relying on withdrawal, a quarter used rhythm, and scarcely one-fifth used the pill.[1] These figures differ markedly from those of the Netherlands and Denmark, for example, and un-

Figure 1. Symbol of Europe's Second Demographic Transition


SNEL RIJEN
IS ZO DOM ALS
SNEL VRIJEN.
Hoge Raad voor de Verkeersveiligheid

A billboard in traditionally conservative Belgium publicly referring to sex—"Driving fast is as stupid as making love fast"—symbolizes the profound shift in attitudes that forms the background to Europe's second demographic transition.

doubtedly reflect dominating norms that would inhibit public discussion of sexual behavior.

That is why the billboard unnerved me somewhat. Had I underestimated how fast attitudes were changing even in Belgium? Could that poster be seen as *the* symbol of the profound shift in norms and attitudes regarding personal relationships, fertility, and the family that has led to dramatic, rapid change in Europeans' demographic behavior? Even though I saw other such posters that had been deliberately defaced or torn and later learned that the term "vrijen" used in the slogan does not sound nearly so sexually explicit to a Dutch-speaking Belgian as it does to a Dutchman, I have no doubt that the Belgian poster *is* such a symbol. It signifies a stage in Europe's demographic development in which the countries that still have above-replacement fertility can be counted on the fingers of one hand and with a few where births no longer exceed deaths. As a result, according to current United Nations medium projections, Europe's population will increase a scant 6 percent between 1985 and 2025, from 492 to 524 million, while the world's population nearly doubles, from 4.5 to 8.2 billion, and nearly one in every five Europeans in 2025 will be pensioners aged 65 and over, with a shrinking working-age population to support them.

The new stage in Europe's demographic history might be called its "second demographic transition."[2] Europe's first demographic transition began with a gradual decline in death rates dating generally from the early 19th century, followed by fertility decline beginning around 1880 in most countries, though earlier in France. By the 1930s, both birth and death rates were generally at low levels. Emigration played an important role in the first transition by relieving population pressures built up by the large gap still remaining between birth and death rates in the late 19th and early 20th centuries.

The start of the second transition can arbitrarily be set at 1965. In the interim had come World War II and the baby boom that followed it. The principal demographic feature of the second transition is the decline in fertility from somewhat above the "replacement" level of 2.1 births per woman, which ensures that births and deaths will stay in balance and population remain stationary over the long run, to a level well below replacement.

If fertility stabilizes below replacement, as seems likely in Europe, and barring immigration, population numbers will sooner or later decline, as had begun already by 1985 in four countries (Austria, Denmark, the Federal Republic of Germany, and Hungary). Changes in mortality and migration—the other two variables that shape changes in population numbers—have had relatively little impact in the second transition, although in northwestern Europe, immigration was substantial before restrictions were imposed when economic recession set in after the oil crisis of 1973 and remains a controversial issue.

Early descriptions of and theories about the demographic transition, based on Europe's experience to the 1930s, usually ended with the stage of "zero" or stationary population growth. The stage of long-term population decline, now imminent in Europe, has since been called "beyond the demographic transition," but its special features in Europe seem to merit the label of the "second demographic transition."

This *Bulletin* describes the broad features of this second demographic transition as it has evolved among Europe's some 30 heterogeneous countries and the public and policy reactions to it. It begins with a description of the dramatic shift in norms and attitudes that forms the background.

Second Demographic Transition: The Background

Two keywords characterize the norms and attitudes behind the first and second demographic transitions and highlight the contrasts between them: *altruistic* and *individualistic*. The first transition to low fertility was dominated by concerns for family and offspring, but the second emphasizes the rights and self-fulfillment of individuals. Demographers Ron Lesthaeghe and Christopher Wilson argue convincingly that industrialization, urbanization, and secularization were the indirect determinants of the first transition.[3] The shift from family-based production to wage-paid labor that accompanied industrialization and urbanization reduced the economic utility of children. They could no longer serve as cheap labor for the parental farm or business but instead required investment in schooling and training to give them a reasonable chance in life. As Australian demographer John Caldwell puts it, the "net flow of wealth" now favored children rather than parents. Moreover, a large number of children could mean the dissipation of family assets like land after the parents' death, so birth control became a sound strategy. Secularization reduced the influence of the churches and increased couples' willingness to practice family planning.

Demographically, the first transition reflected the disappearance of the Malthusian pattern of family formation. Couples no longer had to delay marriage until they acquired a separate means of existence by succeeding their parents. The age at marriage declined and so did the number of people who remained permanently single. Within marriage, the number of children was controlled; quality replaced quantity.

The indirect determinants of the second transition cannot be summed up so neatly. Researchers have not reached a consensus about them, although many would agree that they are strongly related to the functioning of *individuals* in fast-changing, postindustrial societies.

In these societies, one's standard of living is largely determined by one's level and quality of education, degree of commitment to societal goals, and motivation to develop and use one's talents. This holds for women as well as men; both sexes tend to strive to earn a personal income. Getting married and/or having children may involve considerable opportunity costs for—most often—the female partner. She may have to give up her job if the husband accepts one somewhere else or if he owns a business to which they both should devote their energies. And although a two-income family may enjoy a higher standard of living than one with a single income, the partners may not be so free to spend their incomes as they were before marriage. Moreover, to achieve the cost benefits of pooled resources, a temporary partnership may serve as well as a formal marriage.

For a couple, children involve not only opportunity costs and direct expenditures, but also their utility has declined even further. They are no longer either expected or legally required to support their parents in old age or help with family finances. The emotional satisfactions of parenthood can be achieved most economically by having one or perhaps two children.

Beyond the simple calculation of economic utilities, social and cultural changes play a role in people's move away from marriage and parenthood in postindustrial societies. The forces behind these changes have been described in various ways. Some observers see continued secularization and individuation in the new values that encourage people to break with longstanding behavioral patterns. Others say it is the trend toward greater "self-fulfillment"—the desire to realize more of one's own potential—which makes people react in an individualistic manner, with little regard for collective interests. "Individualism is the underlying cause of low fertility and marks a new stage in the awareness of fertility control," writes Austrian demographer Josef Schmid.[4] Swiss sociologist Hans-Joachim Hoffmann-Nowotny goes so far as to ask whether we are not on the way to an "autistic society."[5]

Young couple in a West Berlin nightclub. Low fertility in Western societies could stem from today's quest for greater individual self-fulfillment.

Several authors see a dichotomy in present-day Western society between groups with marked differences in life styles and in attitudes toward social change and family formation. The Scientific Council for Government Policy in the Netherlands distinguishes between sociocratic and technocratic views.[6] Sociocratic people tend to be anti-establishment and believe in the value of social processes: egalitarianism, participation, and "emancipation," or the full participation of women and disadvantaged groups in society. The technocratically oriented tend to seek solutions for society's ills through careful reasoning, planning, and implementation.

The approach of U.S. political scientist

Ronald Inglehart is to distinguish values associated with "materialism" and "postmaterialism."[7] Postmaterialists are suspicious of technological innovation, criticize production processes that damage the environment and the endless acquisition of luxury goods, and put the emphasis on meaningful personal relationships, spontaneity, and self-reliance. Schmid sketches "older" and "newer" branches of postmaterialism:[8]

Older branch: adhering to the achievement motive and attainment of status:

(a) rising expectations;
(b) desire for status goods;
(c) feelings of relative deprivation.

Newer branch: adhering to cultural subgroups and postmaterial values.

In other research, Felling and his colleagues list three "bourgeois" dimensions (family-oriented, economic advancement and security, altruism) in contrast to three "nonbourgeois" dimensions (social egalitarianism, hedonism, inner harmony).[9] I personally use the terms progressiveness and conservatism to describe the dichotomy.[10] I have argued that most European societies have shifted remarkably toward greater progressiveness in the postwar period and this helps explain many demographic changes. Philosophically, "progressiveness" characterizes a tendency to embrace the new, look critically at the present, and largely disregard the past. Conservatism characterizes the converse tendency to stress the value of customs and tradition and oppose changes.

Used in this sense, "progressive" is meant to indicate a shift toward increasing emphasis on "equality" and "freedom." However, this emphasis is not the same in the different spheres of life:

> "In the socio-economic sphere, freedom is, from the progressive point of view, seen as a potential danger to equality, and where a conflict between the two arises, 'equality' usually prevails over 'freedom.' To achieve equality, solidarity is called for and expected. In the socio-cultural sphere the opposite tends to be the case. As long as one's behaviour does not interfere with the freedom of others to act freely, one is free to behave as one sees fit. Different forms of behaviour are considered to be of equal value, even though this will lead to considerable pluriformity.
>
> "In summary, the progressive point of view stresses the equality of opportunities (income, education, etc.) and freedom of choice in behaviour (dress, sexual behaviour, etc.). It can easily be seen that the first line of approach stimulates the growth of the welfare state and its distributive functions. . . . The second line of approach stimulates changes in collective and individual attitudes in many fields, including those regarding fertility and family formation."[11]

The terms used by different authors vary considerably and some may now be inadequate to describe the present situation.[12] But they have so much in common that most likely they essentially reflect the same phenomenon: a large change in norms and attitudes.

Progressiveness in the Netherlands and Western Europe

The change can be traced in a series of surveys conducted since 1965 in the Netherlands which ask national samples of adults their views on a variety of cultural, social, and economic questions. As shown in Table 1 (page 8), the proportions giving a "progressive" answer to these statements relevant to demographic factors changed dramatically from the mid-1960s to the mid-1980s, although most of the change occurred before 1980. For example, approval of outside employment for a mother of school-age children jumped from 17 percent in 1965 to 69 percent in 1986. Tolerance of new types of behavior is now high: voluntary childlessness (86 percent in 1985, up from 22 percent in 1965); cohabitation with no intention of marrying (56 percent in 1985); and "living-apart-together," or a sexual partnership but with separate liv-

Table 1. Attitudes Regarding Marriage, Family, Sexuality, and Euthanasia in the Netherlands: 1965-1986

(Percent agreeing with the statement)

Statement	1965	1966	1968	1970	1975	1980	1983	1985	1986
There is no objection to sexual relations for people intending to marry.	21	—	—	60	59	72	—	—	—
A girl can have sexual relations with a boy if she likes him a lot.	—	—	19	45	44	59	—	—	—
A woman should be free to have an abortion if she wishes.	—	—	—	43	48	55	53	53	49
In certain cases a husband's infidelity is acceptable.	20	—	—	48	49	45	—	—	—
Voluntary childlessness of a couple is acceptable.	22	27	—	60	70	79	85	86	—
Married people are generally happier than single people.	60	—	—	—	35	25	18	—	21
In a bad marriage it is better to divorce even if there are still children living at home.	12	—	—	40	40	48	45	—	43
Labor force participation of a married woman with school-age children is acceptable.	17	—	—	56	58	65	64	70	69
Homosexuals should be free to live as they like.	—	—	64	—	83	93	—	93	92
Cohabitation with no intention of marrying is acceptable.	—	—	—	—	—	41	55	56	—
Living-apart-together is acceptable.	—	—	—	—	—	56	64	63	—
Euthanasia should be permissible.	—	40	—	—	53	52	57	55	51

Sources: Surveys of adults, usually aged 16-74, *Social and Cultural Reports*, 1982 and 1986.

ing accommodations (63 percent in 1985). Barely a fifth of Dutch adults now agree that married people are generally happier than the single.

The change is also documented in similar data from "Eurobarometer" surveys conducted in countries of the European Economic Community (EEC). From the 11 surveys of 1970 to 1984 in the six original EEC countries, Inglehart shows a pattern of increased postmaterialism from the oldest cohort, born in 1886-1905, to the youngest, born in 1956-1965 (see Figure 2). The data also show short-term fluctuations, with postmaterialism losing ground to materialism in years of high inflation.

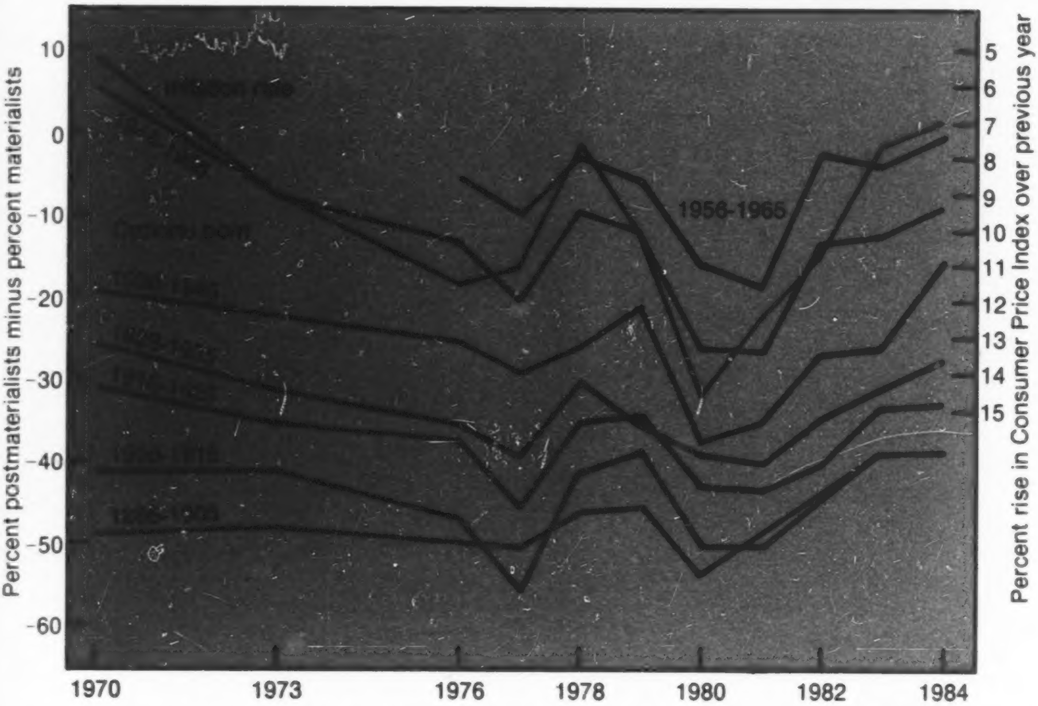
There are no such data for Eastern Europe, so it is difficult to judge whether norms and attitudes have also changed there. But in Western Europe at least, the shift toward progressiveness and postmaterialism appears strong. The trend is not independent of socioeconomic conditions common to modern Western societies, but at the same time seems fairly insensitive to economic recessions or crises. Recessions do alter attitudes somewhat but their impact is limited compared with the increased postmaterialism from cohort to cohort. This is all the more remarkable in light of the rather unfavorable economic conditions and high unemployment that younger Europeans have faced most of their adult lives. The shift in norms appears to have a momentum of its own, and it is against this background that many demographic phenomena should be seen. It is also against this background that the feasibility of government policies to raise fertility significantly should be judged. Economic pronatalist measures are likely to be ineffective and so are other policies which go against or disregard the trend to individualism.

A Sequence of Events in Family Formation

A standard sequence with variations?

An interesting perspective on recent population change in Europe is to see the

Figure 2. Shift to Postmaterialism Among Birth Cohorts and Inflation Rates in Six West European Countries: 1970-1984



Source: R. Inglehart, "Aggregate Stability and Individual-Level Flux in Mass Belief Systems: The Level of Analysis Paradox," *American Political Science Review*, Vol. 79 (1985) pp. 97-116.

Note: See text for description of postmaterialism and materialism. Data are for the six original members of the European Economic Community: Belgium, Federal Republic of Germany, France, Italy, Luxembourg, the Netherlands.

changes that have occurred in factors bearing on family formation as a sequence through which all countries pass. The timing and speed of the sequence have differed substantially between Eastern and Western Europe and within these regions, but there is strong evidence of a logical ordering. Each step taken seems to have led to the next; each option chosen made a further choice possible. Looking back, the sequence of events that led to today's low fertility seems both logical and understandable. One wonders why it was not predicted! Reflecting the shift to progressiveness and individualism, the sequence involves shifts from marriage toward cohabitation, from children to the adult couple as the focus of a family, from contraception to prevent unwanted births to deliberate, self-fulfilling choices whether and when to conceive a child, and from uniform to widely diversified families and households. Let us sketch the sequence as it has progressed to completion in a "standard" European country.

To trace the story, one must begin with the great impact of World War II. Virtually all European countries were involved in the fighting, suffered from occupation and shortages, and experienced the uncertainties and sorrows that war brings. Many young men saw military service and became familiar with techniques to prevent conception and venereal disease. Retrospective surveys document a steady increase from cohort to cohort in the proportions of adults who have experienced premarital intercourse and a sharp postwar decline in the age at which such sexual relations begin. Geeraert, citing a long list of research in Western European countries since 1900, concludes that among young women in particular, both students and working women, premarital intercourse is increasingly common.[13] By 1971, 83 percent of 21-year-old employed men and women in the Federal Republic of Germany reported having experienced premarital sexual relations. In Denmark in the ten years from 1958 to 1968, the proportion of 21-year-old female students who had had premarital sexual intercourse increased from 60 to 97 percent. Figures reported by sociologist Gerrit Kooy for the Netherlands show an increase in these proportions from 57 percent for men and 32 percent for women born 1903-1918 to 85 and 79 percent, respectively, for the cohort born 1943-1947.[14]

Social attitudes regarding premarital or extramarital sexual relations did not change so rapidly. Most couples therefore sought official sanction through marriage. This was also the solution in the case of an out-of-wedlock pregnancy.

Besides official sanction to live together, most couples who married in the early 1950s also wanted and were economically ready to start a family. The average age at first marriage declined, the interval between marriage and the first birth remained short, and birth rates for lower-order births began to rise. The increase in fertility in the early childbearing ages more than made up for the decline in higher-order births, so that the total fertility rate increased—at least to the mid-1960s.

The decline in higher-order births reflected general acceptance of birth control as a means to limit family size. This was the tail end of the first demographic transition in which birth control was used not for spacing but to bring completed family size down from seven or eight children in the 1880s to two or three some 50-60 years later. But the contraceptives available before the mid-1960s were not very effective or suitable for inexperienced couples and many "unwanted" children were no doubt born.

The decline in age at first marriage loosened the link between marriage and the start of childbearing. Marriage was still desired to earn official approval of sexual relations (certainly by a couple's parents), but for many young couples it no longer marked a readiness to have children. Parents anxious to help their just-married children avoid the burdens of an immediate birth may well have introduced them to family planning. Family planning organization enrollments soared. Membership in the Dutch organization (Netherlands Association for Sexual Reform, NVSH) more than doubled from 97,000 in 1955 to a peak of 206,000 in 1965 (and now has almost evaporated). As contraception became more popular for avoiding births early in married life, the age at marriage could decline further. Young married couples could accumulate assets together before deciding to take on the care of children.

Just about that time, in the mid-1960s, the effective, as well as safe, pills and IUDs came on the market. They were readily adopted. First and second birth intervals lengthened, and there were somewhat fewer lower-order births. Doubtless due also to further reductions in family-size norms, fertility above age 30 plummeted and the birth of fourth, fifth, and later children became an exception. The proportion of unwanted births—conceived out of marriage or too late in marriage—declined.

By the early 1970s, actual or anticipated changes in abortion law made it possible to terminate unintended premarital pregnancies safely, so the frequency of unwanted first births declined further. The gradual disappearance of "forced marriages" slowed the decline in age at first marriage and this age began to climb.

Abortion could, of course, also be used to avert unwanted births among married women—high-order births, risky and socially unacceptable births to older women, and, if so desired, births conceived extramaritally. Increased adoption of sterilization to control fertility after couples had all the children they wanted further cut the number of higher-order births in the early 1970s. Fertility fell below replacement level.

Once it was generally accepted that sexual relations in marriage were not solely or primarily aimed at procreation and contraceptives of high quality had become available, a further step was taken. Law changes had already increased the frequency of divorce and legal separation. Divorce and separation were also occurring at earlier ages and sooner after marriage. Since young people now married with the intention of delaying childbearing for several years, it is understandable that the need to seek a seal of approval for such an arrangement was questioned. Why not start living together and marry only when children were wanted or on the way? Stable unions were formed, differing from early marriage mainly in that they were "paperless." The first marriage rate began to decline and the age at first marriage went up.

Initially, there was evidently some pressure on couples in "paperless marriages" to marry when a birth was desired or on the way. Premarital pregnancies resulting in births within eight months after marriage increased. But after a while the pressure to marry eased so much that couples no longer felt required to marry before having children. The proportions ever-marrying declined markedly; age at first marriage rose further. Remarriages became much less common. A rise in out-of-wedlock fertility became noticeable, particularly among somewhat older women. Some of these women deliberately chose to bear a child without having a stable relationship with a male partner. The proportions of out-of-wedlock births legitimated by marriage or the male partner declined. In addition, voluntary childlessness was no longer solely an option for men and women who elected not to marry. Being married or living in a stable union no longer differentiated people strongly with regard either to having children or desired family size. Fertility seemed to stabilize well below replacement level.

This "standard" sequence of changes in family formation is obviously impossible to trace in detail for all 30 of Europe's heterogeneous countries and the sequence itself is likely to be different as it evolves among them. However, the countries can be grouped roughly according to their place in the sequence as it has evolved so far and fairly simple period data available for a reasonable number of the countries demonstrate the basic features of the second transition to low fertility. These features involve four related shifts that can be summarized as follows:

1. Shift from the *golden age of marriage* to the *dawn of cohabitation;*
2. Shift from the era of the *king-child with parents* to that of the *king-pair with a child;*
3. Shift from *preventive contraception* to *self-fulfilling conception;*
4. Shift from *uniform* to *pluralistic families and households.*

Where countries are in the sequence

Only two European countries appear to have experienced the full sequence of changes in family formation that have led to very low fertility—Denmark and Sweden. Even here there have been deviations from the "standard" sequence described above. However, it is in these two countries that the proportion of out-of-wedlock births has risen from about 10 percent in 1956-60 to well over 40 percent currently. And it is the tremendously changed social significance of the "married" status that probably best demonstrates the transition toward greater individualism.

The following four groups indicate where European countries now are in relation to the standard sequence.

First group. In addition to Denmark and Sweden, this group includes the

Street scene in Sweden. Sweden and Denmark have progressed furthest with the family formation changes that have led to very low fertility.

Northern and Western European countries which appear to be following close in their tracks. The birth rates of these countries as of the mid-1980s generally fall between 10 and 12 per 1,000 population and the rate of natural increase (births minus deaths) is no more than 0.4 percentage points above zero or actually negative (see data for 1985 in Table 2). Finland, Norway, the United Kingdom, Austria, Belgium, France, the Federal Republic of Germany, the Netherlands, Switzerland, and Italy (in Southern Europe) all qualify for this group. Here the second demographic transition is well advanced.

Second group. This group includes Greece, Malta, Portugal, Spain, and Yugoslavia in Southern Europe. The fertility decline has been less marked in these countries; they follow the first group at a distance. Current birth rates range from 12 to 16 per 1,000 population and the rate of natural increase usually exceeds 0.4 percent. The second transition is late, but there is little doubt that it has begun and will be completed.

Third group. The six Eastern European countries make up this group: Bulgaria, Czechoslovakia, the German Democratic Republic, Hungary, Poland, and Romania. Political developments after World War II have set this group apart from the rest of Europe in many respects. Here the second demographic transition has a different shape. For example, the postwar trend toward greater sexual freedom appears to be less pronounced. In reaction to forcible attempts to change the structure and norms of society after the political change, many people have clung tenaciously to traditional mores in their personal lives. On the other hand, legal abortion became available in these countries earlier than in most other European countries, while government intervention to raise birth rates has had some impact on fertility trends. Current birth rates are close to 14 per 1,000 population, except for Hungary (12.2 in 1985) and Poland (18.2).

Fourth group. This group covers the remaining countries which, for a variety of cultural and historical reasons, are all late in completing the *first* demographic transition. It includes Iceland and Ireland in Northern Europe and Albania and Turkey in Southern Europe. Even parts of the USSR belong to this group. Whether or when they will begin the second demographic transition is not easy to predict. Their current birth rates tend to be high by European standards and rates of natural increase range from about 0.9 percent in Iceland and Ireland to 2.1 percent in Turkey.

This grouping helps put trends in context in presenting the following data which demonstrate how the second demographic transition has evolved.

Marriage, Divorce, Cohabitation

Marriage

Numerous measures illustrate the rather dramatic swing from the altruistic to the

Table 2. Population Statistics for European Countries: 1985

Region and country	Population mid-1985 (thousands)	Birth rate (per 1,000 population)	Death rate (per 1,000 population)	Natural increase (percent)
Northern Europe				
Denmark	5,114	10.6	11.4	−0.08
Finland	4,908	12.8	9.8	0.30
Iceland	241	15.9	7.1	0.88
Ireland	3,552	17.5	9.0	0.85
Norway	4,153	12.4	10.6	0.18
Sweden	8,350	11.8	11.3	0.05
United Kingdom	56,125	13.3	11.9	0.14
Western Europe				
Austria	7,555	11.5	11.8	−0.03
Belgium	9,903	11.5	11.2	0.03
France	55,172	13.9	10.1	0.38
Fed. Rep. Germany	61,020	9.6	11.5	−0.19
Liechtenstein	28	13.2	5.7	0.75
Luxembourg	366	11.1	10.8	0.03
Netherlands	14,484	12.1	8.5	0.36
Switzerland	6,374	11.5	9.2	0.23
Southern Europe				
Albania	2,962	26.2	5.8	2.04
Greece	9,935	11.7	9.3	0.24
Italy	57,128	10.1	9.5	0.06
Malta	383	14.2	7.4	0.68
Portugal	10,229	12.8	9.6	0.32
Spain	38,602	12.5[a]	7.8[a]	0.47[a]
Turkey	49,272	30.2[b]	9.4[b]	2.08[b]
Yugoslavia	23,123	15.9	9.1	0.68
Eastern Europe				
Bulgaria	8,957	13.2	12.0	0.12
Czechoslovakia	15,500	14.5	11.8	0.27
German Dem. Rep.	16,644	13.7	13.5	0.02
Hungary	10,649	12.2	13.9	−0.17
Poland	37,203	18.2	10.3	0.79
Romania	23,017	15.5[c]	10.3[c]	0.52[c]
USSR	278,618	19.6[c]	10.8[c]	0.88[c]

Sources: United Nations (UN), *Population and Vital Statistics Report: Data Available as of 1 October 1986*, Series A, Vol. 38, No. 4, and for Turkey: *World Population Prospects: Estimates and Projections as Assessed in 1984* (New York: 1986); and A. Monnier, "La conjoncture démographique: l'Europe et les pays développés d'outre-mer" (Demographic Trends: Europe and Overseas Developed Countries), *Population*, Vol. 41, No. 4-5 (July/October 1986) Table 2, p. 838.

[a] 1983. [b] Average for 1980-85. [c] 1984.

individualistic marriage pattern and the concomitant shift from "the golden age of marriage to the dawn of cohabitation." A particularly interesting one is the total first marriage rate: the sum of age-specific first marriage rates per 1,000 single men or women under age 50 in a given year. This indicates the proportion of men and women who would ever marry, given the situation of that year. Although its method of calculation can result in rates of more than 1,000 first marriages per 1,000 single persons, which is impossible for a real cohort, it nevertheless reflects changes well. Table 3 presents these rates for 1965 to the mid-1980s, as published by French demographer Alain Monnier.

In 1965 the rates for Group 1 countries of Northern and Western Europe were

Table 3. Total First Marriage Rates Below Age 50 in European Countries: 1965-1985

(First marriages per 1,000 never-married persons)

Region and country	Males					Females				
	1965	1970	1975	1980	1985	1965	1970	1975	1980	1985
Northern Europe										
Denmark	1,026	752	621	491	527[a]	984	799	661	592	559[a]
Finland	959	896	638	608	610[b]	930	939	702	671	668[b]
N. Ireland	980	1,134	900	750	—	952	1,086	942	766	—
Norway	921	922	755	615	546[a]	872	956	794	648	571[a]
Sweden	986	584	566	486	479[a]	957	624	628	525	514[a]
England and Wales	1,038	1,009	840	754	666[a]	1,002	1,040	876	761	669[a]
Scotland	1,112	1,055	899	786	749[c]	1,023	1,030	889	792	750[c]
Western Europe										
Austria	923	854	731	690	637	994	913	751	675	613
Belgium	992	966	854	746	688[d]	1,002	981	888	775	718[d]
France	1,013	915	822	689	530	993	919	858	706	542
Fed. Rep. Germany	913	896	734	644	578	1,102	974	764	656	591
Luxembourg	—	870	852	653	567[a]	—	870	799	661	579[a]
Netherlands	1,124	1,013	767	671	627[c]	1,130	1,062	827	691	647[c]
Switzerland	892	868	624	643	651[a]	897	829	650	659	671[a]
Southern Europe										
Greece	1,218	1,080	1,180	848	942[c]	1,185	1,056	1,158	875	986[c]
Italy	998	1,017	894	764	731[c]	1,024	1,007	931	765	733[c]
Portugal	1,105	1,187	1,450	840	798[a]	1,012	1,090	1,275	808	811[a]
Spain	1,008	1,030	949	749	684[c]	982	1,003	1,024	735	675[c]
Yugoslavia	991	991	865	—	—	1,027	970	892	—	—
Eastern Europe										
Bulgaria	951	963	969	923	878[b]	893	976	1,010	981	943[b]
Czechoslovakia	965	918	927	796	870[b]	901	906	976	892	934[b]
German Dem. Rep.	858	989	901	789	686[b]	991	1,025	930	818	710[b]
Hungary	986	990	944	767	796[a]	978	968	998	894	880[a]
Poland	—	—	948	838	870[b]	—	—	940	900	967[b]
Romania	909	891	993	—	—	942	840	998	—	—

Sources: Monnier, "La conjoncture démographique," Table 4, p. 840, and personal communication, 1986.

[a]1984. [b]1983. [c]1981. [d]1982.

close to 1,000, indicating an era when almost everyone married. This was the golden age of marriage.[15] The decline clearly started in Sweden, where the rates had already dropped to 584 for men and 624 for women by 1970. Denmark and Switzerland followed suit in 1975. The most recent figures suggest that not much more than 50 to 60 percent of men and women in Northern and Western European countries will ever marry if conditions remain as they are. This is not very likely, for it is the unusual combination of the lowering of the age at first marriage until the 1970s, followed by "postponement" of marriage that results in the pattern shown in Table 3 and it is not yet certain how permanent this postponement will be. However, it seems clear that the proportions of each generation who ever marry are likely to be much lower in the coming decades than they were in the 1960s and 1970s.

The change began later in Southern Europe. Total first marriage rates were still high in 1975 and it is only after the mid-1970s that the effects of postponement and the reversal in the decline of age at first marriage become evident. In the Eastern European countries, the total first marriage rates were generally higher in 1975 than ten years earlier. The

Table 4. Marriage Statistics for European Countries: 1970 and 1984

Region and country	Marriage rate per 1,000 population		Mean age of women at first marriage 1984 or latest available date[a]	Mean age of women at first birth 1984 or latest available date[a]
	1970	1984		
Northern Europe				
Denmark	7.4	5.6	26.1	25.4
Finland	8.8	6.0	24.8	25.7[b]
Iceland	7.8	5.9	24.4	22.9
Ireland	7.1	5.2	25.1	25.7
Norway	7.6	5.0	24.4	26.1[c]
Sweden	5.4	4.5	27.3	26.5
United Kingdom	8.5	7.0	23.6	25.6[d]
Western Europe				
Austria	7.1	6.1	23.7	24.8[c]
Belgium	7.6	6.0	22.3	24.9[c]
France	7.8	5.1	23.9	25.6[c]
Fed. Rep. Germany	7.3	5.9	24.4	26.0[c]
Luxembourg	6.4	5.4	23.3	25.5[c]
Netherlands	9.5	5.7	24.1	26.3
Switzerland	7.4	6.0	25.9	26.8[c]
Southern Europe				
Greece	7.7	5.3	22.5	23.4
Italy	7.4	5.2	24.0	25.2
Malta	7.3	7.9	24.4	—
Portugal	9.0	6.9	22.7	23.6
Spain	7.3	4.8	25.4[e]	23.9[e]
Turkey	—	6.9	17.7[b]	20.1[e]
Yugoslavia	9.0	7.3	22.1[e]	23.1[e]
Eastern Europe				
Bulgaria	8.6	7.5	20.8	22.3
Czechoslovakia	8.8	7.9	21.1	22.9
German Dem. Rep.	7.7	8.0	21.5	22.4
Hungary	9.3	7.0	21.6	23.1
Poland	8.6	7.7	22.6	23.6
Romania	7.2	7.8	—	22.9
USSR	9.7	9.6	—	23.2[f]

Sources: Council of Europe, *Recent Demographic Developments in the Member States of the Council of Europe* (Strasbourg: 1986); Monnier, "La conjoncture démographique" and personal communication, 1986; G. Calot, Institut National d'Études Démographiques (INED), personal communication, 1986; *Eurostat Demographic Statistics*, 1986; UN, *Demographic Yearbook*, 1984 and earlier editions.

[a] Most data are for 1984 or close to it. Data for 1979 and earlier are noted.

[b] 1978. [c] Legitimate births only. [d] First marital child in first marriage of mother. [e] 1979. [f] 1974.

decline thereafter is most noticeable in the German Democratic Republic and Hungary.

The marriage rate per 1,000 total population also illustrates the rapid change. In 1984 these rates in Northern and Western European countries ranged between 5 and 7 per 1,000 population, while rates between 7 and 10 were common in 1970 (see Table 4). Significant declines have also occurred in Southern Europe even though the total first marriage rate indicates that marriage is still substantially more likely there than in Group 1 countries. In Eastern Europe, declines in marriage rates have so far been limited and the latest reported mean ages at first marriage for women are somewhat lower (20-22) than elsewhere (Table 4). Mean ages at first marriage for women about 1984 were highest in Denmark (26.1) and Sweden (27.3). In these two countries, as well as in Iceland, where the proportion of out-of-wedlock births is also well above 40 percent, the mean age of women at first marriage is now higher than the mean age of women at first birth (Table 4). But elsewhere the relationship between age at first marriage and age at first birth is still fairly strong. Except for Turkey, the lowest mean ages at first birth are found in Eastern Europe.

For seven Northern and Western European countries for which a good time series is available, French demographer Gérard Calot has shown how the mean age at first marriage first declined and then rose again.[16] In 1955 the mean age at first marriage for women in these countries ranged between 23 and 25 years. The low points were reached in 1966 in Denmark (22.4 years) and in Sweden (23.4), followed by Finland in 1968 (23.3), Norway in 1973 (22.4), France in 1974 (22.4), the Federal Republic of Germany in 1975 (22.5), and the Netherlands in 1976 (22.6).

In Northern and Western Europe, the decline in the propensity to marry has been paralleled by a reluctance to remarry. Although the number of second marriages has increased, many divorced or widowed men and women now choose to remain unmarried rather than enter a new legal bond. In many instances, that decision may be swayed by financial concerns—the prospective loss of pensions and benefits derived from the former marriage—but a more basic reason is doubtless the waning of marriage as an institution. U.S. sociologists John Modell, Frank Furstenberg, and Douglas Strong have pointed out that traditionally marriage has been an integral part of a tight sequence of status transitions and a keystone in everyone's life course.[17] It was bound up with leaving the parental home, initiation into a regular sex life, parenthood, position in the labor market, setting up an independent household, and so on. Now with the dramatic improvement in living conditions that has come with the advent of welfare states, marriage has fewer implications for one's early adult life. Thus, not marrying or remarrying has become a reasonable option and divorce is far easier to consider than a few generations ago.

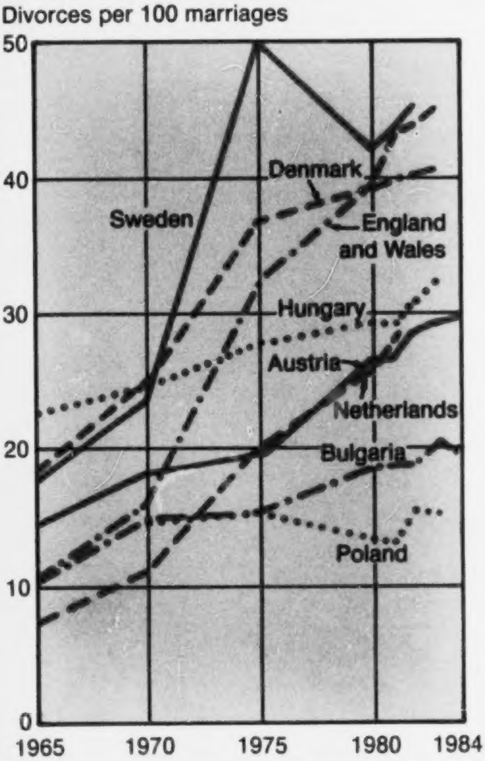
Divorce

Available statistics on divorce in Europe invariably show a substantial rise since at least 1965. In the countries where divorce is most common—Austria, Denmark, England and Wales, the German Democratic Republic, Hungary, and Sweden—the annual rate about 1980 was 10 to 12 divorces per 1,000 existing marriages. The total divorce rate shown in Figure 3, which is comparable to the total first marriage rate, indicates the proportions of marriages likely to end in divorce, under the conditions of the given year. Currently topping the list are Sweden (45.4 percent in 1982), Denmark (45.1 percent in 1983), England and Wales (40.4 percent in 1983), and Hungary (32.4 percent in 1983). In Poland, where the Roman Catholic Church remains strong, the increase has been negligible: 14.6 percent in 1970 to 15.5 percent in 1983. Divorce also tends to be infrequent in Southern Europe; in some countries, it is still prohibited and in others, the law has been relaxed only recently. The steep rise in divorce in Northern and Western Europe is related to law changes of the early 1970s permitting divorce by "mutual consent," which has since replaced "matrimonial offense" as the most common grounds for divorce.

Cohabitation

To reach full adulthood, Europe's young people no doubt still consider the most decisive steps to be the entries into employment, marriage, and parenthood. These statuses represent financial independence, commitment to another per-

Figure 3. *Total Divorce Rates in Selected European Countries: 1965-1984*



Source: Monnier, "La conjoncture démographique," p. 841.

son, and long-term responsibility for dependents. Ending full-time education, leaving home, and starting to cohabit are more diffuse steps and represent statuses that are less permanent.[18] However, once cohabitation has shed its deviancy, cohabitation without marriage becomes a social institution. Swedish sociologist Jan Trost states: "In today's Sweden and Denmark, couples do not choose to cohabit instead of marry. They just cohabit."[19] He considers that cohabitation was uncommon in Sweden until the end of the 1960s, that a period of change and acceptance followed, and since 1972 or 1973 it has become "normal" behavior and in no way regarded as deviant. To illustrate the final stage, he writes: "Thus, unmarried cohabitation can be classified as a category slightly different from marriage in one respect, that is, all marrieds have experienced cohabitation without marriage but not all cohabitants have experienced marriage."

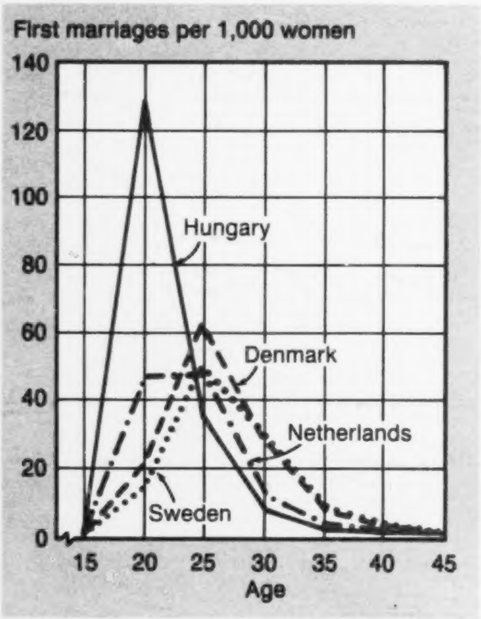
Many Northern and Western European countries seem to be following the Swedish and Danish pattern and have at least reached the stage of "change and acceptance," signaling the dawn of cohabitation. The process can be traced in responses of a national sample of women interviewed in 1982 in the Netherlands. Those who started cohabiting for the first time at ages 18-25 were asked about the outcome of this first union. The outcomes at the three-year mark were as follows:[20]

Began cohabiting	Status three years later (in percent)		
	Separated	Married	Still cohabiting
1971-73	12	55	33
1974-76	7	46	47
1977-79	14	41	45

It appears that from the early to the late 1970s the idea of cohabitation as "trial marriage" was rapidly replaced by its being regarded as a distinct alternative to marriage. Of the respondents who had cohabited for more than six years (some 20 percent of all cohabitants), about half indicated that they did not intend to marry. This suggests that for at least 10 percent of young people who started cohabiting after the mid-1970s, unmarried cohabitation will be a permanent status.

The changes in the propensity to marry clearly have a profound impact on age-specific nuptiality curves. Figure 4 (page 18) shows 1984 age-specific first marriage rates for women in Hungary, the Netherlands, Denmark, and Sweden, provided by Calot. They form a pattern that indicates the stages in a likely development. In Hungary, marriage is still popular and early, peaking at age 20 for women in these rates for 1984. By now in Sweden, marriage—if it occurs at all—is delayed to a fairly late age, typically age 26 for women as of 1984, and children

Figure 4. Age-Specific First Marriage Rates for Women in Denmark, Hungary, the Netherlands, and Sweden: 1984



Source: G. Calot, INED, personal communication, 1986.

tend to be present at their parents' first wedding ceremony.

Since unmarried cohabitation is unrecorded in national vital registration systems, country comparisons are possible only from survey and census data available for a few countries. The following table shows the percentage of cohabiting women among all women aged 20-34 who were married or cohabiting in Sweden, Denmark, France, and Great Britain in 1980 or 1981, and in the Netherlands in 1984.[21]

	Percent cohabiting of women cohabiting or married at ages:		
Country	20-24	25-29	30-34
Sweden	69	37	18
Denmark	65	29	13
Netherlands	28	13	5
France	16	6	2
Great Britain	11	6	2

It is essential to understand that cohabitation and marriage can in many respects be regarded as two sides of the same coin. Both represent "pair-bonding." And although Sweden tops the above list, if cohabitants are added to married women, the proportions of the "de facto" married in each age group are very similar. Among women aged 25-29, this proportion was 81 percent in Great Britain in 1980 and 78 percent in both Sweden and France in 1980-81.[22] In that sense, it is wrong to conclude that "the end of marriage implies the end of the family." In assessing the demographic impact on family formation, it would be irrelevant to distinguish cohabiting couples or women from those who are married if the stability and fertility of these unions were the same.

Fertility

Total fertility rates

The days of the "king-child" are over in Europe. With few exceptions, current levels of fertility foretell population decline—which had already arrived by 1985 in Austria, Denmark, the Federal Republic of Germany, and Hungary (see Table 2, page 13). As of 1984 or 1985, total fertility rates were above 2.10 lifetime births per woman—which is about the replacement fertility level needed to keep births and deaths in balance over the long run—only in Ireland, Malta, and Poland, as well as the USSR, among the countries shown in Table 5. Omitted from the table but also in this category were Albania and Turkey, with 1985 rates of about 3.4 and 3.8, respectively, according to current United Nations medium estimates. In Eastern Europe, Hungary's rate is lowest at 1.74 in 1984 and 1.83 in 1985. Most rates in the other three regions as of 1984 or 1985 were closer to 1.5. But Luxembourg's rate was down to 1.39 in 1985 and the rate of 1.29 in the Federal Republic of Germany for both 1984 and 1985 was the lowest ever recorded for any country in the world.

Table 5. Total Fertility Rates in European Countries: 1950-1985

(Average number of lifetime births per woman at current age-specific fertility rates)

Region and country	1950	1960	1965	1970	1975	1980	1983	1984	1985
Northern Europe									
Denmark	2.58	2.54	2.61	1.95	1.92	1.55	1.38	1.40	1.45
Finland	3.16	2.71	2.47	1.83	1.68	1.63	1.74	1.70	1.65
Iceland	3.86	4.29	3.71	3.00	2.65	2.48	2.24	2.08	1.93
Ireland	—	3.75	4.03	3.87	3.41	3.23	2.74	2.58	2.49
Norway	2.53	2.85	2.93	2.51	1.98	1.72	1.66	1.66	1.66
Sweden	2.30	2.17	2.42	1.94	1.77	1.68	1.61	1.65	1.73
United Kingdom	2.22	2.69	2.83	2.44	1.82	1.92	1.77	1.77	1.80
Western Europe									
Austria	—	2.65	2.68	2.30	1.83	1.65	1.56	1.52	1.47
Belgium	2.34	2.52	2.60	2.24	1.73	1.69	1.56	1.52	1.49
France	2.93	2.73	2.84	2.47	1.93	1.94	1.79	1.81	1.82
Fed. Rep. Germany	2.10	2.37	2.50	2.02	1.45	1.45	1.33	1.29	1.29
Liechtenstein	—	—	—	2.61	1.67	2.02	1.62	1.93	—
Luxembourg	—	2.29	2.41	1.97	1.63	1.51	1.45	1.43	1.39
Netherlands	3.09	3.12	3.04	2.57	1.66	1.60	1.47	1.49	1.50
Switzerland	2.40	2.44	2.61	2.10	1.61	1.55	1.52	1.53	1.51
Southern Europe									
Greece	2.57	2.23	2.32	2.36	2.33	2.21	1.94	1.82	—
Italy	2.49	2.41	2.55	2.43	2.19	1.66	1.51	1.50	1.42
Malta	—	—	—	—	2.20	2.20	2.20	2.20	—
Portugal	3.04	3.13	3.07	2.76	2.59	2.14	1.95	1.87	
Spain	2.46	2.79	2.97	2.82	2.80	2.22	1.71	—	—
Yugoslavia	3.74	3.80	2.71	2.29	2.27	2.13	—	—	—
Eastern Europe									
Bulgaria	2.94	2.30	2.03	2.18	2.23	2.05	2.00	1.99	—
Czechoslovakia	3.04	2.39	2.37	2.07	2.43	2.16	2.08	2.07	2.07
German Dem. Rep.	2.30	2.33	2.48	2.19	1.54	1.94	1.79	1.74	—
Hungary	2.60	2.02	1.82	1.96	2.35	1.91	1.75	1.74	1.83
Poland	3.71	2.98	2.52	2.20	2.27	2.26	2.40	2.37	2.31
Romania	3.17	2.34	1.91	2.89	2.60	2.43	2.00	—	—
USSR	2.88	2.84	2.46	2.39	2.41	2.26	2.37	2.41	—

Sources: Council of Europe, *Recent Demographic Developments*, 1986, p. 67; Calot, personal communication, 1986; and Monnier, "La conjoncture démographique," and personal communication, 1986.

Note: A total fertility rate of 2.10 is about the "replacement" level of fertility needed to keep births and deaths in balance over the long run.

As seen in Table 5, fertility trends since 1950 have varied from country to country, but the greatest contrast is between Eastern Europe (Group 3 countries) and the rest of Europe. In Eastern Europe, a decline in the total fertility rate began after a brief postwar baby boom and was generally marked between 1950 and 1965. The exception was the German Democratic Republic, which followed one of the two patterns characteristic of the rest of Europe in this period: The rate tended to rise in countries where it had been fairly low in 1950 (as in the GDR) but remained stable in countries where the 1950 rates were well above average. In 1965, the year of the "Great Divide," nearly all countries of Northern, Western, and Southern Europe had a total fertility rate above 2.50, and often well above, while the rates in Eastern Europe were almost all below that level.

Fertility trends since 1965 have been irregular in Eastern Europe. At some point the rates have risen and then usually dropped again in all six countries

Box 1. German Democratic Republic: Pronatalist Measures Reap Success

From the late 1960s, the population of the German Democratic Republic aged rapidly as the birth rate fell from 16.5 per 1,000 population in 1965 to 10.4 in 1974. Deaths exceeded births. This trend came to a halt in the mid-1970s. Natural increase turned positive again and since the early 1980s, births have exceeded deaths by about 2,300 a year. There are three reasons why the GDR is one of the few countries in the world that has managed to reverse a decline in fertility. First, the standard of living of young families improved. Second, a pronatalist population policy was introduced in 1976. Third, there was an increase in the number of women in the childbearing ages (women born during the birth rate rise in the 1960s).

The upturn in births occurred despite the unrestricted availability of contraceptives and legal abortion on request during the first 12 weeks of pregnancy. The government measures were based on two principles. Most important is that women and families must be given the opportunity to have children, while at the same time women must be guaranteed the economic independence of employment. The second principle is that single measures to increase fertility can only lead to short-term effects.

The measures introduced in 1976 include:

- Beginning with the second birth, mothers are entitled to a "baby year," or year of leave, with an allowance amounting to 70-80 percent of salary.
- Mothers may take leave up to a child's third birthday, with reemployment guaranteed after that.
- Mothers have an extra day of leave per month to work at home.

A family outing in the GDR.

- Mothers of two children and more may work a 40-hour week (instead of 43¾ hours) at full pay.
- Day care nurseries were expanded to meet 70 percent of needs.
- Priority in allocation of housing is given to households with a certain number of children.
- Low-interest loans are available at the time of marriage and birth of each child to subsidize buying a home or home equipment.

Source: W. Speigner and G. Winkler, *Pronatalist Population Policy in the GDR*, paper presented at the DGWB/EAPS Conference on the Demographic Impact of Political Action, Bielefeld, March 11-14, 1986

of the region. In five countries, the rise was associated with government pronatalist measures (see boxes on the German Democratic Republic, this page, and Romania, page 30). However, the upswing in Poland in the early 1980s seems to have been spontaneous (see box, page 53).

The history of fertility change in the rest of Europe after 1965 is one of decline, with some signs of stability in recent years. In a few countries, the total fertility rate has turned up slightly since 1983, most notably in Denmark and Sweden, which suggests that the low point may have been reached. Apparently not all "king-pairs" want to have only one child!

That the rise in fertility in Northern and Western Europe until the mid- to late-1960s was associated with the decline in age at first marriage is evident from a comparison of the contribution to the total fertility rate of women under age 25 with that of women aged 30 and over, as shown in Figure 5 (next two pages). In the six countries of these regions included in the figure, the part of the total fertility rate accounted for by women under age 25 increased until 1965, reaching a range generally between 0.85 and 1.10 births per woman. At the same time, the contribution of women over 30 fell and in 1975 was only about 0.40 to 0.50 births per woman in this age group. After 1975 the level stayed more or less constant for women over 30 but fell markedly for women under age 25. In Finland, the Federal Republic of Germany, and the Netherlands, women under 25 now account for less of the total fertility rate than women older than 30.

In the three Southern European countries shown in Figure 5, the level for women under 25 continued to rise until 1975 and then also plunged, particularly in Italy (a Group 1 country). The steady decline since 1965 in the share of the total fertility rate accounted for by women over 30 suggests the increasing popularity of contraception among older women, although modern contraceptives have not been easily available in Italy, Portugal, and Spain until recently.

In Eastern Europe since at least 1955, fertility among women under age 25 has averaged more than one birth per woman—much higher than the level of women this age elsewhere in Europe—and women over 30 have accounted for very little of the total fertility rate. In 1983 women under 25 in the German Democratic Republic contributed 1.09 births per woman to the total fertility rate of 1.75 births per woman, while the figure for women this age in the Federal Republic of Germany was 0.40 of the total fertility rate of 1.33. For women over 30, these figures were just 0.23 in the GDR and nearly twice as high—0.43—in the FRG.

Birth order

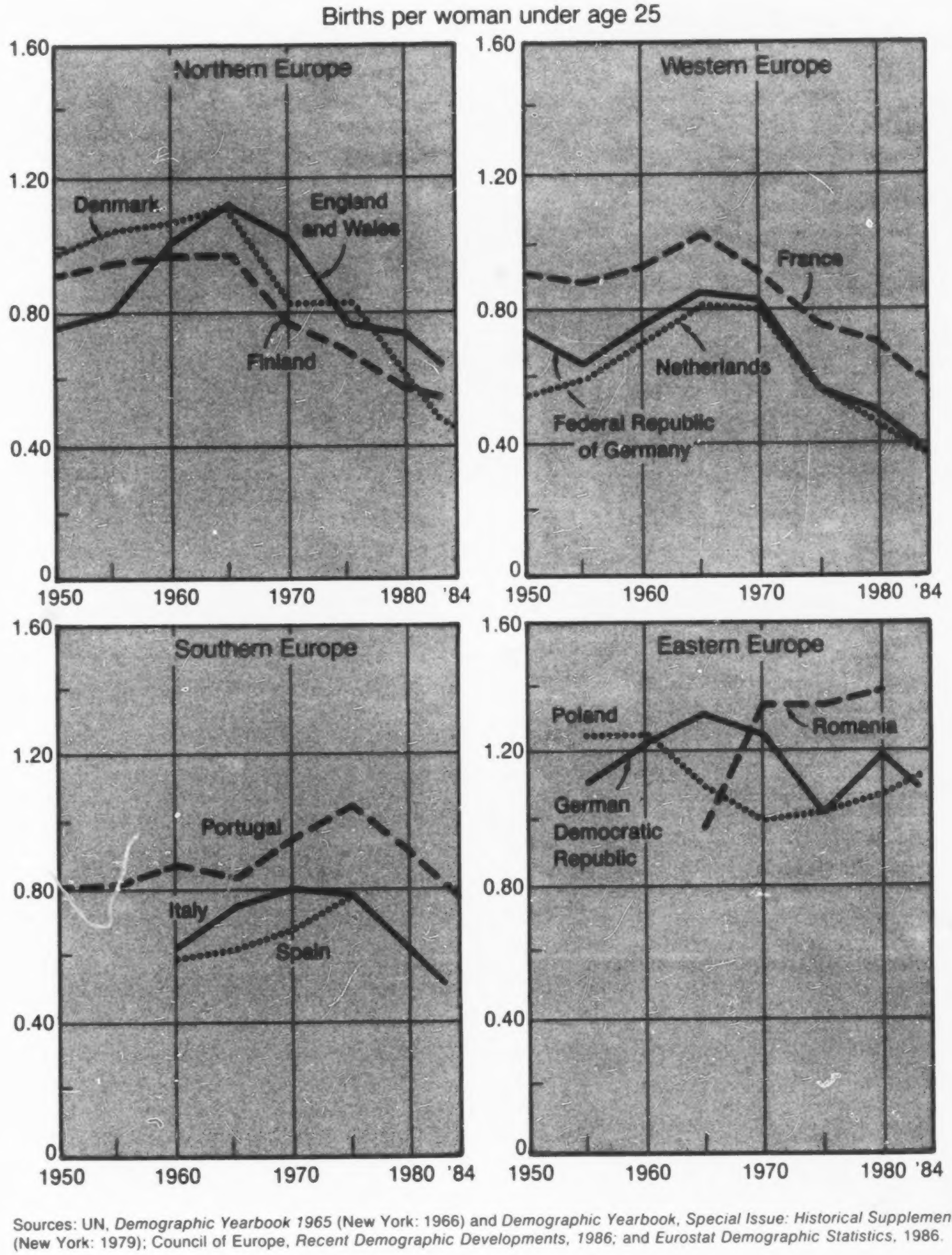
Fertility trends since 1950 are of course also reflected in the distribution of births by birth order. Almost everywhere, the share of third and higher-order births among all live births dropped rapidly after the 1950s, particularly after 1965. This trend clearly reflects improved contraception, including sterilization among couples who consider their families complete, and easier access to abortion. Illustrative of the latter was the dramatic rise in the proportion of third and higher-order births in Romania following the legal abortion restrictions of October 1966 (see box, page 30).

In some Northern and Western European countries, the proportion of third and higher births has risen perceptibly since the late 1970s. Among the reasons for this are the "marriage bust," which reduces the number of first and second births, and the presence in some countries of sizable immigrant groups whose fertility is relatively high. But a third element, undoubtedly, is that the decline in marital fertility appears to have ended in these countries. Couples who elect to marry apparently want about as many children as their predecessors.

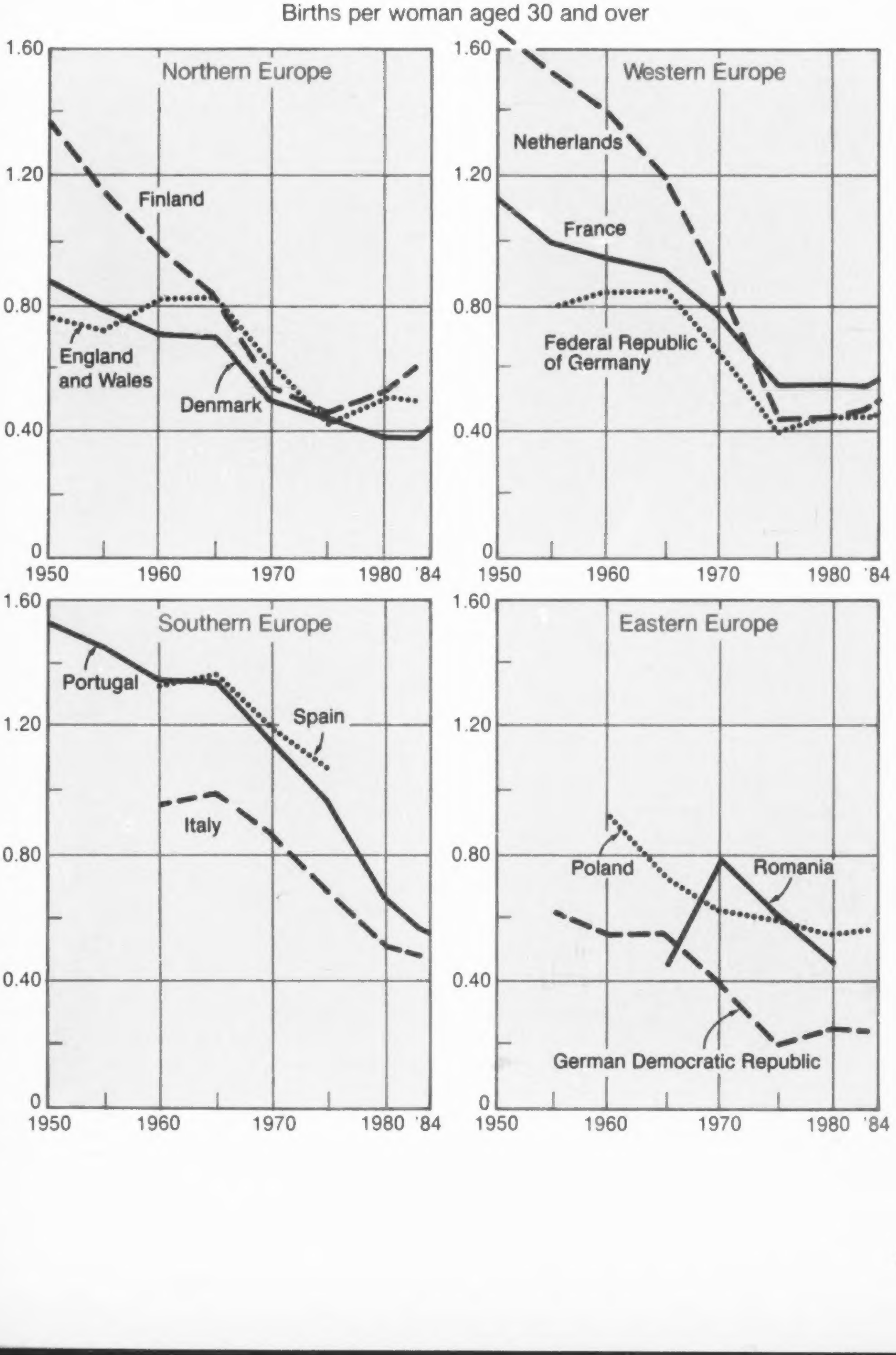
In Northern, Western, and Southern Europe, third and higher-order births now typically account for 20 to 25 percent of total births. The distribution of the other three-quarters by birth order is strikingly similar: In 1984 in Denmark, Norway, the United Kingdom, France, and the Federal Republic of Germany, first births made up almost exactly 45 percent of all births and second births, 35-37 percent. The share of first and second births has gone up significantly since the 1950s in these five countries.

The pattern is more varied in Eastern Europe, probably as a result of government measures to raise birth rates and restrict abortion in some countries, and limited access to modern contraceptives. In 1980 more than 30 percent of total births were third and higher order in Romania, but only 10 percent in the Ger-

Figure 5. Contribution of Women Under Age 25 and 30 and Over to the Total Fertility Rate in Selected European Countries: 1950-1984



Sources: UN, *Demographic Yearbook 1965* (New York: 1966) and *Demographic Yearbook, Special Issue: Historical Supplement* (New York: 1979); Council of Europe, *Recent Demographic Developments, 1986;* and Eurostat *Demographic Statistics,* 1986.


Births per woman aged 30 and over
Northern Europe
Finland
England and Wales
Denmark
Western Europe
Netherlands
France
Federal Republic of Germany
Southern Europe
Portugal
Spain
Italy
Eastern Europe
Poland
Romania
German Democratic Republic
0
0.40
0.80
1.20
1.60
1950
1960
1970
1980
'84

Box 2. Unmarried Motherhood in Austria

A relatively large number of children are born out of wedlock in Austria. This is only partly attributable to "modern" trends in life styles and sexual ethics as in Sweden, for example. In Austria, the main factors are tradition, family policy, and the fact that the Roman Catholic Church has recovered little of its influence lost during the German occupation of 1938-1945.

During the 19th century, about a third of women were unmarried at birth. The proportions were especially high in the districts of Karnten and Salzburg, as well as in the eastern districts of North Tirol, southwest Oberösterreich, the Inn Valley, and Western and Upper Styria.

The overall proportion of out-of-wedlock births declined dramatically to 11.2 percent in 1965 and then rose, even though marital fertility has remained relatively constant since 1977 after an initial drop. At present, more than 22 percent of children are born out of wedlock, and more than 35 percent in some districts. The Murau district in south-central Austria is highest at 42 percent during 1981-83.

Extramarital fertility is highest in districts where it was a widespread, socially accepted phenomenon during the last century. Rural hereditary rights prescribed that only children who had the right to inherit the family farm could marry, unless the partner was heir to the farm of his or her father, and only one child—usually the eldest—had the right to inheritance. As a result, many remained unmarried. Moreover, the heir him/herself was not allowed to marry until the father died. Before the father's death, the heir and his/her partner as well as the unmarried children all lived in the parental home. Children born out of wedlock were very welcome as labor for the farm.

Although the influence of hereditary rights is waning in agricultural communities and no more than 10 percent of all women work in rural areas people are still tolerant of unmarried mothers and more accepting of changing sexual and marital norms in these districts than in districts without this tradition. The "modernization" of life styles which has increased extramarital fertility elsewhere in Northern and Western Europe has not played such an important role in Austria, as witnessed by the fact that unmarried mothers are not common among the social avante-garde, but rather among the farming population and lower classes.

Source: R. Munz, *Family and Socio-political Measures in Austria: Planned and Unplanned Effects*, paper presented at the DGBW/EAPS Conference on the Demographic Impact of Political Action, Bielefeld, March 11-14, 1986.

man Democratic Republic. In the GDR, the proportion of first births has dropped from 59 percent in 1974 to 54 percent currently, but early marriage is still linked with an early first birth in that country (see Table 4, page 15).

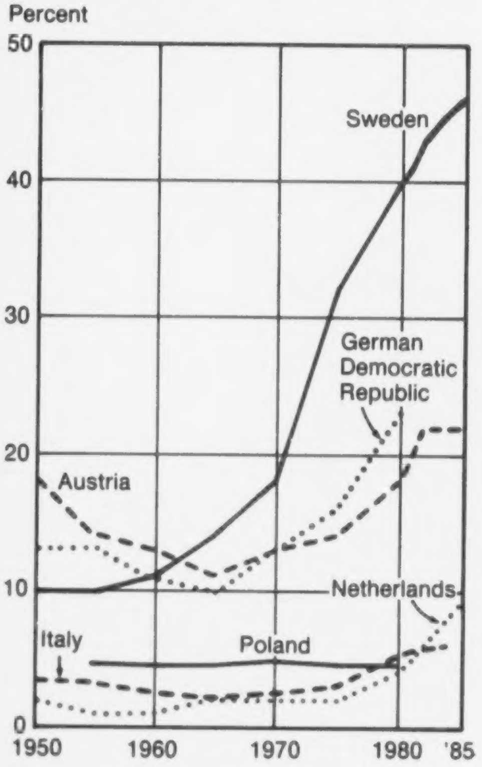
Out-of-wedlock births

Virtually all European countries have experienced an increase in out-of-wedlock births since the mid-1950s, the important exceptions being Czechoslovakia, Portugal, and Yugoslavia. However, the variation in proportions of out-of-wedlock births among total births is a particularly revealing measure of Europe's cultural diversity. Currently, the figures range from 0.6 percent in Malta and 1.6 percent in Greece in 1983 to 45 percent in Iceland in 1983 and 46 percent in Sweden in 1985.

Some variation has been evident for a long time. In certain districts of Austria, for example, out-of-wedlock childbearing has been common for generations (see box). In general, countries where out-of-wedlock fertility has traditionallly been high or low still tend to have rates well above or below the European average. In countries where the levels have traditionally been high, the proportions of out-of-wedlock births are usually highest in rural areas: among farmers because of inheritance rules and among landless farm workers because of their traditional religious nonconformity.

Figure 6. Out-of-Wedlock Fertility in Selected European Countries: 1950-1985

(Out-of-wedlock births as percent of total births)



Sources: Council of Europe, *Population Studies No. 16* (Strasbourg: 1985) and *Recent Demographic Developments, 1986*, p. 66.

In Eastern Europe, the proportions of out-of-wedlock births have been fairly stable at 5 to 10 percent since 1950, except in the German Democratic Republic where the figure was up to 23 percent in 1980 (see Figure 6). The proportions are generally low in Southern Europe, with Portugal currently highest at 10 percent. In Northern and Western Europe, increases have been substantial in recent decades, with a tripling or quadrupling in the proportion in Scandinavian countries.

In most of Europe, illegitimacy is still negatively correlated with the proportion of Catholics in the population and positively with the proportions of the nonreligious or nonpracticing.[23] However, it is important to recall that the concept of "illegitimate" is changing greatly as European countries go through the "standard" sequence of changes in family formation. Technically, the measure remains the same but it covers different realities in countries at different stages of development. In one country it may still reflect failed "preventive" contraception; in another it will be accepted as normal. Somewhat paradoxically, it was the advent of "perfect" contraception that initially enabled couples to live together outside marriage without fear of unwanted pregnancy and forced marriage and now enables them to make a deliberate, self-fulfilling choice to have children. And since norms have changed, they can do so without fear that such children will be stigmatized. In fact, even a woman who does not want a stable relationship with a man can decide to have a child.

In an analysis of illegitimacy rates as a proportion of marital fertility rates, Swiss demographer François Höpflinger has shown that most of the increase in Northern and Western European countries reflects increases in sizes of the populations at risk—never-married, divorced, and widowed women.[24] Older women appear more likely than younger women to bear an out-of-wedlock child, though teenage pregnancy is significant in some of these countries. The analysis also shows a loosening of the relationship between marriage and childbearing over time.

That the availability of efficient contraceptives after the mid-1960s and wider access to legal abortion somewhat later reduced forced marriages in Northern and Western Europe is evident from the decline after 1970 in the number of births within eight months of marriage per 100 marriages among women aged 15-49. Now many of such births that may occur are likely to signify a deliberate decision to have a child and to marry once one is on the way. Höpflinger has also shown, however, that an out-of-wedlock pregnancy is increasingly unlikely to prompt a marriage. Between 1970 and 1980, there was an increase in all the Northern and Western European countries he studied in the proportion of out-of-wedlock pregnancies (out-of-wedlock births plus births within eight months of marriage) that ended in an out-of-wedlock birth. By 1980 the proportion was over 80 percent in Denmark and Sweden. Elsewhere it was lower—62 percent in England and Wales, 61 percent in France, 50 percent in the Netherlands, 28 percent in Switzerland—but still indicative of a trend toward greater tolerance of births outside marriage. There is a clear recognition of the right to have a child, not only for unmarried couples in a stable union but also, in some countries, for other unmarried women.

The right *not* to have a child, or voluntary childlessness, is now also recognized. Höpflinger, in estimating the proportions of women born around 1940, 1945, and 1950 in five Western European countries who are likely to remain childless, found the proportions highest for the youngest cohort: 31 percent in Austria, 21 percent in the Federal Republic of Germany,and 20 percent in England and Wales. In France it was only 10 percent—another evidence of Europe's rich diversity.

Below-replacement fertility

The overall result of the changes in fertility behavior in European countries after 1950 has been that since the famous year of 1965, virtually all have reached a net reproduction rate well below 1.00. (The net reproduction rate is derived from the age-specific fertility and mortality rates of a given year and refers to women and their daughters. A rate of 1.00 signifies that each generation of women is having exactly enough daughters to replace itself in the population.) The first country to experience below-replacement fertility was Hungary in 1958; the most recent additions are, for example, Greece in 1981 and Portugal in 1982 (see Figure 7).

In the countries where the changes have been allowed to run their "natural course" without government intervention, trends in the net reproduction rate are very similar. The shift from the era of the king-child with parents to that in which king-pairs (or individuals) elect to have one or two children to enrich their own lives seems to have run along parallel lines. Figure 7 illustrates this particularly well for Northern and Western Europe. Elsewhere, government intervention has influenced the timing of events considerably.

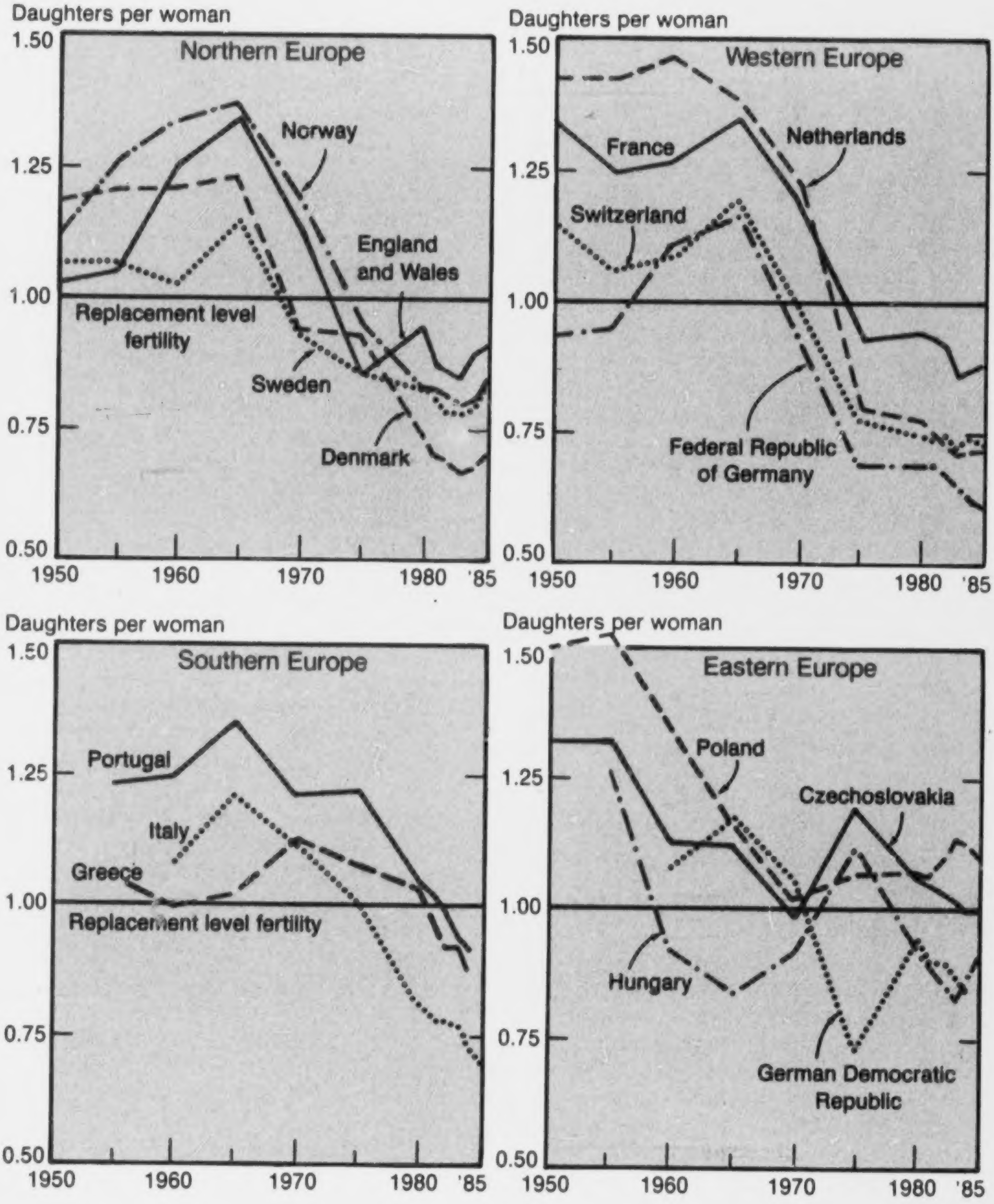
Birth Control

Contraception and sterilization

The improvement in contraceptive technology in the mid-1960s and increased access to legal abortion and sterilization are important milestones in the standard sequence of family formation events. Indeed, it would be difficult to overestimate the socio-cultural, as well as demographic, impact of these phenomena. Contraception shifted from a measure used primarily to prevent births that would reduce a family's well-being and standard of living to a means toward achieving greater self-fulfillment. Modern contraception permits greater freedom in sexual relations and for the fecund, the choice for children is made only when it is felt this would enrich a relationship or realize more of the potential of the individuals concerned.

This is not to suggest that the fertility decline would not have occurred without improved contraception and easier access to legal abortion. It is well known that if the motivation is strong enough, people will find ways to control their fertility. But the timing and pace of the second demographic transitioin would have been different, different age groups would have been affected, more mistakes would have occurred, and the shift in norms might have been less spectacular.

Figure 7. Net Reproduction Rates in Selected European Countries: 1950-1985



Sources: UN, *Demographic Yearbook: Historical Supplement* and *Demographic Yearbook 1981* (New York: 1983); and Council of Europe, *Recent Demographic Developments, 1986.*

Note: See text for definition of the net reproduction rate. A rate of 1.00, exactly one daughter per woman, is the replacement level of fertility needed to keep births and deaths in balance over the long run.

The rapid change in contraceptive behavior can be traced through surveys conducted in several countries between 1966 and 1972 and another set of 1975 through 1978.[25] In the first period, the percentage of married women of childbearing age currently using any form of contraception was just 35 percent in Turkey, but ranged from 59 to 77 percent elsewhere. Hungary in 1966 already had a net reproduction rate well below replacement level but 66 percent of contraceptive users practiced withdrawal and 16 percent used the condom; also, there were 1.3 abortions per live birth (see Figure 9, page 32). This was a clear demonstration of what strong motivation and tradition can achieve. In the other countries also in this first period, high proportions of married women using contraception relied on withdrawal and other traditional methods. In Dutch-speaking areas of Belgium (1966), 51 percent relied on withdrawal and 26 percent on the rhythm method. In France (1972), these proportions were 52 and 14 percent. In Yugoslavia (1970), 73 percent used withdrawal, as did 49 percent in Poland (1972) and 52 percent in Czechoslovakia (1970), while in England and Wales (1967), the condom was popular (41 percent). Around 1970, it was only in the Netherlands (1969), Denmark (1970), and Finland (1970) that the pill had already gained some popularity, with proportions of 45, 37, and 26 percent, respectively, among married women using contraception.

Surveys taken in the second period, 1975-78, revealed that the pill had become the most widely used method in most Northern and Western European countries, particularly among young women. Also important in some countries were the IUD (28 percent of contraceptive users in Norway in 1977) and sterilization (15 percent in Great Britain in 1976; 10 percent in Denmark in 1975). Traditional methods had lost ground in almost all countries. Withdrawal accounted for only 17 percent of contraceptive use in Hungary by 1977. However, the proportions using traditional methods were still high in other Eastern European countries. In Czechoslovakia in 1977, for example, 42 percent used withdrawal compared with 24 percent for the pill and IUD combined. In Romania, only 58 percent of women under 45 and married to their first husbands interviewed in a national survey of 1978 were using contraception; of these, 44 percent relied on withdrawal and 41 percent on rhythm. Also in Dutch-speaking Belgium in 1975-77, withdrawal and rhythm, used separately or together, were still practiced by 37 percent of current users.

Later surveys in a few countries indicate that the shift to more efficient methods continues. Robert Cliquet and Hein Moors have traced the current contraceptive use of birth cohorts interviewed in successive surveys conducted from the late 1960s to the early 1980s in the Netherlands and Dutch-speaking areas of Belgium. Pill use increased with women's age up to a peak in the late twenties or early thirties, and sterilization is clearly now popular to prevent births toward the end of the childbearing ages (see Table 6).

That sterilization is likely to become still more popular is evident from the researchers' estimates of the proportions of the married couples covered in the surveys who would ever adopt sterilization—the proportions already sterilized, either wife or husband or both, plus the proportions who might or intended to undergo sterilization, based on the wife's survey responses. For Dutch-speaking Belgian couples with wives born in 1947-51, this proportion was 76 percent. Most couples in this part of Belgium apparently prefer not to use the pill or IUD for extended periods of time. Once they have all the children they want, they are very likely to turn to sterilization to avoid further pregnancies.

Abortion

Although Northern and Western European countries were the first in Europe to adopt modern, efficient contraception on

Table 6. Contraceptive Use Among Birth Cohorts in Belgium and the Netherlands: 1966/69-1982/83

	Belgium (Dutch-speaking areas)			Netherlands			
Women born:	1942-1946			1945-1949			
Year surveyed:	1966	1976	1983	1969	1975	1977	1982
Age at survey:	20-24	30-34	37-41	20-24	26-30	28-32	33-37
Percent distribution of women currently using contraception, by method							
Withdrawal	60	24	11	7	3	—	—
Rhythm	18	8	5	13	3	—	—
Withdrawal and rhythm combined	3	7	10	—	—	—	—
Douche	1	—	—	—	—	—	—
Condom	8	9	8	28	12	9	10
Diaphragm	1	0	—	1	0	—	—
IUD	—	6	8	1	6	8	13
Pill	10	40	23	51	71	60	26
Sterilization	2	6	35	—	5	16	48

Source: R.L. Cliquet and H.G. Moors, "De anticonceptionele revolutie in Vlaanderen en Nederland" (The Contraceptive Revolution in Flanders and the Netherlands), in D.J. van de Kaa and R. Lesthaeghe (eds.), *Bevolking: Groei en Krimp* (Population: Growth and Decline) (Deventer: van Loghum Slaterus, 1986) Tables 3 and 4.

— = no data available or not reported.

a large scale, Eastern Europe was the forerunner in permitting freely available legal abortion. The USSR, in 1920, was the first country ever to legalize abortion at the request of any woman without restrictions in the first 12 weeks of pregnancy. Abortion was banned again in 1936 but reinstated, on request, in 1955. Following this lead, five of the six Eastern European countries have permitted abortion on request for varying periods since the mid-1950s: Bulgaria, April 1956-January 1968; Czechoslovakia, broad liberalization December 1957-December 1962, on request from January 1987; German Democratic Republic, March 1972 to the present; Hungary, June 1956-January 1974; Romania, September 1957-October 1966.[26] Except in the GDR and with the latest change in Czechoslovakia, these periods of unrestricted abortion were followed by moderate or broad legal restrictions or restrictive interpretations of the law (see box on Romania, page 30). Poland's law of 1956, permitting abortion on broad socioeconomic grounds though not on request, still stands.

Legal abortion on broad grounds or on request came much later in the rest of Europe. Abortion is still permitted only to save a woman's life in Belgium, Malta, and Ireland. Yugoslavia followed the Eastern European pattern: liberalization began in 1952 and since 1974, the right to a "free decision on childbirth" is guaranteed in the country's constitution. Liberalization began in the 1930s in Iceland, Denmark, and Sweden and spread to Finland and Norway after World War II. But most broad changes in Northern and Western Europe occurred in the early to mid-1970s. As in Eastern Europe, individual countries have their own specific sets of requirements, safeguards, and limits. In several countries, interpretation of the law changed over time, while de facto liberalization may have preceded de jure changes by years. One example is the Netherlands, where nonprofit abortion clinics operated freely from the early 1970s, although a liberalized abortion law was not passed until 1981. Long and bitter struggles have usually preceded and followed parliamentary debates and decisions on abortion law. In Italy, for example, the law was liberalized in 1978. A subsequent attempt to repeal this stat-

Box 3. Romania: Permanent Struggle Against Falling Birth Rates

A Romanian country girl. The government wishes there were many more like her.

Following the lead of the USSR and other Eastern European countries, Romania legalized abortion on request in September 1957. By 1965 the abortion ratio had soared to about 4,000 per 1,000 live births and the birth rate had dropped to 14.6 per 1,000 population.

To reverse these trends, legal abortion was suddenly and drastically restricted and the import of contraceptives curtailed in October 1966. Abortion was authorized only for victims of rape or incest, for women over 45 or with four living children, where there was a chance that the child would be handicapped, and under a few other special mental and physical conditions.

The following year, in 1967, abortions dropped to about the 1958 level and the birth rate surged to 27.4. However, the trends reversed again and by 1983 the birth rate had dropped to 14.3 and abortions were up to 1,300 per 1,000 births—most of them provided on "mental health" grounds. In March 1984, President Nicolae Ceausescu announced dramatic new pronatalist measures:

- Doctors who perform abortions other than under the strict terms of the 1966 law (only for women over 45 or with four living children and for medical reasons) are subject to 25 years' imprisonment or even death.
- The minimum age at marriage for women was lowered to 15.
- Childless couples will be taxed an extra 5 percent on top of a surcharge already levied.
- All women aged 20-30 must regularly undergo a pregnancy test, followed by a monthly checkup in the event of pregnancy.

The official target is a fertility rise to four children per woman. This number is now held up as "the most sublime duty toward the nation and its people." Women who do not meet the target risk their careers.

Sources: "Romanian Population Policy," *Population and Development Review*, Vol. 10, No. 3 (September 1984) pp. 570-537; "In Brief: Romania," *People*, Vol. 11, No. 4 (1984) p. 35; "How Romania Tries to Govern Fertility," *Population Today*, February 1987.

ute was defeated by popular referendum. In the United Kingdom, at least 11 attempts have been made in parliament to restrict the liberal abortion act of 1967. "So far, these attempts have been unsuccessful," reported abortion statistics experts Christopher Tietze and Stanley Henshaw in 1986.[27]

Reliable data even on legal abortion are not easy to obtain. The most frequently available measure is the legal abortion ratio: the number of legal abortions per 1,000 live births. Figure 8 shows the current ranking on this measure for the 19 European countries with recent data. The ratio for Romania at the top of the list—1,300 in 1983, before the 1984 restrictions—is 12 times the ratio of the Netherlands at the bottom, 107 in 1984. Except for Poland, the ratios of Eastern Europe are generally higher than in the rest of Europe. Women in Eastern Europe average 1 to 2.5 legal abortions in their lifetime, in contrast to a general range of 0.2 to 0.6 elsewhere in Europe.

Figure 9 (page 32) shows trends in

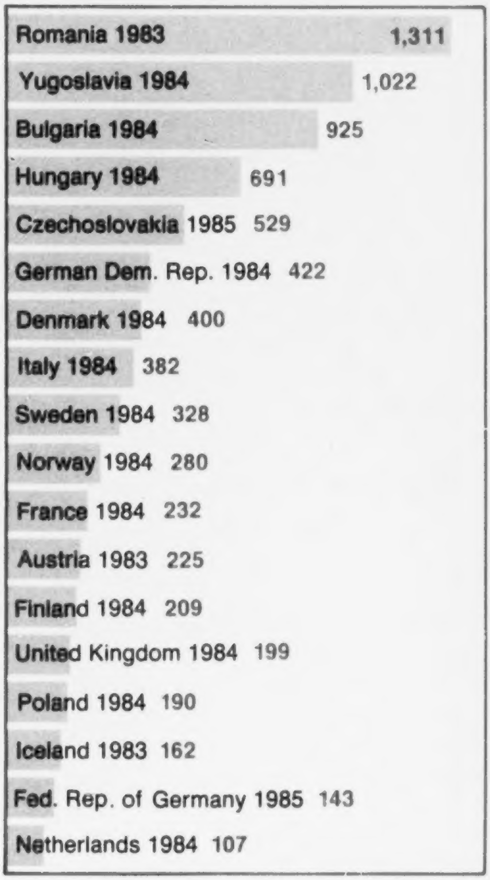
legal abortion ratios since 1960 for eight countries. It can be seen that legalization was relatively late in Western Europe and especially that significant fluctuations in abortions occurred in Eastern Europe. These resulted from changes in legal provisions and/or practice.

Tomas Frejka has analyzed the impact of such changes on contraceptive behavior and fertility in Eastern Europe.[28] He estimates that in the mid-1960s in Romania and also in the USSR, the total abortion rate, or average number of lifetime abortions per woman under the prevailing conditions, was well over 7. In such situations, he writes: ". . . where modern contraceptive means are scarce . . . legal induced abortions can perform a role modern contraceptive devices now commonly perform where they are available." He notes that abortion liberalization invariably led to an increase in the incidence of abortion, moderate in the countries like Czechoslovakia with "widespread experience with traditional contraceptives," but large elsewhere. Where modern contraceptives became widely used, as in the German Democratic Republic and Hungary in the 1970s, the incidence of abortion declined. He concludes that legal abortion has had more "fertility inhibiting" effect in Eastern Europe than in other regions of the world, but the impact of abortion has been less than that of contraception, even though legal abortion levels have been the world's highest and withdrawal, at least through the 1970s, was the most commonly used contraceptive method. Summing up, he writes:

> "The extent to which fertility trends were affected by the relatively easy access to induced abortion remains an open question. The early years of the liberal abortion legislation [the late 1950s] were also years of fertility decline. It is likely that the abortion legislation facilitated and possibly expedited the ongoing fertility declines. Restrictions in the liberal abortion legislation—which were almost always coupled with pronatalist economic and social measures—generated some fertility increases of a transitory nature. In the long run, however, it would seem that even though the incidence of induced abortion might be high, fertility levels have been only marginally affected by abortion legislation."

Figure 8. Legal Abortion Ratios in 19 European Countries: Latest Available Year

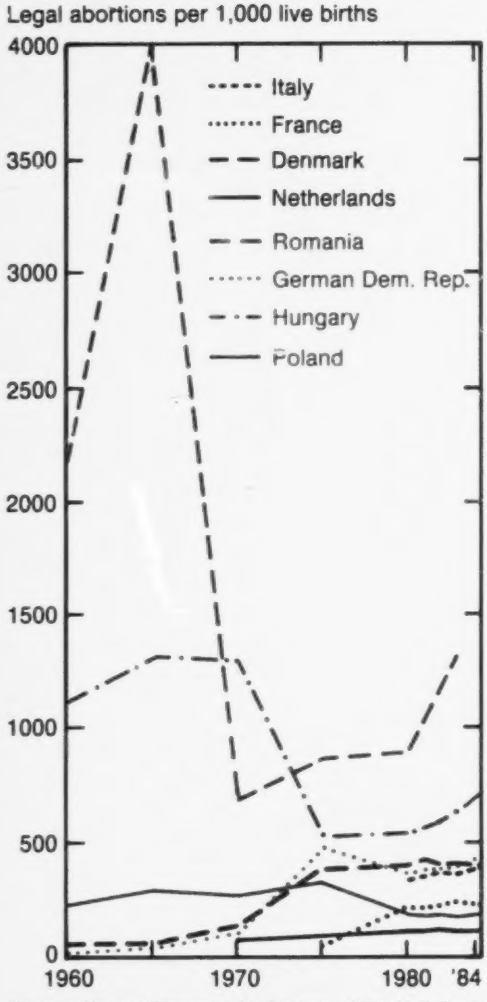
(Legal abortions per 1,000 live births)



Sources: Monnier, INED, personal communication, 1986; *Eurostat Demographic Statistics;* and C. Tietze and S. K. Henshaw, *Induced Abortion: A World Review 1986*, 6th edition (New York: Alan Guttmacher Institute, 1986).

Frejka appears to believe that easier access to abortion (and efficient contraception) has mattered less in Europe's second demographic transition than motivation, or as phrased at the beginning of this section: "If the motivation is strong

Figure 9. Legal Abortion Ratios in Selected European Countries: 1960-1984



Sources: *Eurostat Demographic Statistics*, 1984; H. P. David, "Eastern Europe: Pronatalist Policies and Private Behavior," *Population Bulletin*, Vol. 36, No. 6 (Washington, D.C.: Population Reference Bureau, 1982); Monnier, personal communication, 1986; Tietze and Henshaw, *Induced Abortion: 1986*; UN, *Demographic Yearbook*, 1972, 1980, 1984.

enough people will find ways to control their family size." Perhaps that is so. But it should also be noted that Frejka does not deal with the socio-cultural aspects of contraception and abortion and thus with the ideological or normative shifts in thinking which liberalizations and restrictions represent. And these will be correlated with changes in the status of women and other variables, so the indirect effects may thus be considerable. Moreover, it should be recognized that abortion is by nature more a "preventive" than a "self-fulfilling" means of birth control. One has to make a decision "not to have" rather than "to have" a child. This in itself may help explain the differences in fertility behavior between Eastern European countries and the rest of Europe.

Household Patterns

The changes in the propensity to marry, divorce, separate, remarry, or cohabit and changes in fertility behavior and in the ages at which children leave home, along with mortality trends and differentials, have had a marked impact on household patterns in Europe. The once uniform pattern of the nuclear family household comprised of a married couple and their children has been replaced by a much more complex and diverse pattern. Two women without partners may jointly care for their children, a divorced man may do it alone, a pair may raise their children in good harmony but in two different places, more people now live alone, and so on. Comparative data are scarce, partly because statistical definitions of households vary from country to country, and some relevant events, like children leaving the parental home, seldom appear in statistics. But some research gives a picture of the current diversity.

Living arrangements of young people

Recent research by British demographer Kathleen Kiernan casts light on young people's shift to independence and their living arrangements in Northern and Western Europe. For the United Kingdom as of 1981, she calculated that by age 21, 34 percent of men and 52 percent of women have left their parental home, 4 percent of men and 9 percent of women have entered a first cohabiting union, 7 percent of men and 24 percent of women have married, and 4 percent of men and 13 percent of women have had a child.[29] These figures portray a gradual transition to independence, related, for example, to leaving full-time education and entering a job.

Data for six countries in 1982 (United Kingdom, Ireland, the Netherlands, France, Federal Republic of Germany, and Denmark) reveal considerable differences in living arrangements of 20-24 year-olds.[30] Among men, the proportion still living with parents was highest in Ireland (62 percent) and lowest in Denmark (26 percent). For women, those figures were 57 and 11 percent. The great majority of the men and women who had left home were living with a partner, almost all in a marriage in the U.K. and Ireland, but often in cohabitation elsewhere, especially in Denmark. Living alone or sharing accommodations with unrelated persons were 39 percent of men in Denmark, 26 percent in the Federal Republic of Germany, and about 15 percent in the Netherlands and France. The proportions were only marginally higher for women.

Country variations in the proportion of young people living independently of parents may partly reflect stages in the move toward greater "individualism." However, many other factors will also be involved, such as the availability of cheap rental housing and of jobs and training facilities in the home locality. In countries with housing shortages, young people are probably particularly less likely to leave home to live alone or share accommodations.

One-person households

Between about 1960 and 1980, proportions of one-person households rose markedly and average household size shrank in virtually all European countries for which data are available (see Table 7, page 34). Demographer Karl Schwarz correctly points out that in addition to the shift toward more independent life styles, other important factors in these trends are the improved health and financial situation of the elderly, the fact that few European households now have live-in servants, and the unsuitability of most urban housing for more than a one-generation family.[31]

The increases in one-person households are generally most marked and the proportions of such households around 1980 are highest in Northern and Western Europe. In 1980 the proportion of households with only one person ranged as high as 33 percent in Sweden and 30 percent in the Federal Republic of Germany. In the four Southern European countries shown in Table 7, these proportions were still only 11 to 13 percent.

French sociologist Louis Roussel has shown that men form an increasingly large share of persons in one-person households in some European countries.[32] Between 1960 and 1980, the number of males per 100 females in one-person households remained unchanged at 45 in the Federal Republic of Germany, but increased from 47 to 53 in France, 42 to 55 in the Netherlands, 66 to 77 in Sweden, and 40 to 60 in Switzerland. The shift did not follow a straight line, which again may reflect different stages of development. It is possible, for example, that in a first stage large numbers of widows dominate the sex ratio of persons living alone and at a later stage, represented probably by Sweden, there are relatively large numbers of divorced or separated men who opt to live alone and this moves the sex ratio in a different direction. It needs to be emphasized that economic conditions have a direct bearing on the possibility of being able to live alone. If the economic climate is unfavorable for the young, the divorced, and the elderly, the ultimate expression of individualism—"living alone"—has little chance of becoming widespread.

Data for Switzerland suggest how the trend in persons living alone may be evolving. Between 1960 and 1980

Table 7. Household Size in Selected European Countries: Around 1960 and 1980

Region and country	Year	Percent distribution of households by number of persons					Average persons per household
		One	Two	Three	Four	Five or more	
Northern Europe							
Denmark	1960	20	27	20	18	15	2.9
	1981	29	31	16	16	8	2.4
Finland	1960	22	19	18	16	25	3.3
	1980	27	26	19	18	10	2.7
Ireland	1966	13	20	17	14	36	4.0
	1977	16	22	15	15	32	3.9
Norway	1960	18	24	21	19	19	3.1
	1980	28	26	16	18	12	2.7
Sweden	1960	20	27	22	18	13	2.8
	1980	33	31	15	15	6	2.3
England and Wales	1966	15	31	21	18	15	3.0
	1981	22	32	17	18	11	2.7
Western Europe							
Austria	1951	18	27	22	15	18	3.1
	1980	26	26	17	16	14	2.8
France	1962	20	27	19	15	20	3.1
	1975	22	28	19	15	15	2.9
Fed. Rep. Germany	1961	21	26	23	16	14	2.9
	1980	30	29	18	15	8	2.5
Netherlands	1960	12	24	19	18	27	3.6
	1979	21	29	16	21	13	2.9
Southern Europe							
Greece	1951	9	16	18	19	39	4.1
	1979	11	21	21	24	22	3.8
Italy	1961	—	—	—	—	—	3.6
	1977	13	22	22	21	22	3.3
Portugal	1960	8	19	22	19	32	3.9
	1981	—	—	—	—	—	2.9
Yugoslavia	1961	14	15	17	19	35	4.0
	1971	13	16	19	21	31	3.8
Eastern Europe							
Bulgaria	1956	6	18	23	24	28	3.7
	1975	17	23	21	21	18	3.1
Czechoslovakia	1961	14	27	22	20	17	3.1
	1980	22		66		12	2.8
Hungary	1960	15	26	24	19	17	3.1
	1980	20	28	22	19	11	2.8
Poland	1960	16	19	19	20	27	3.5
	1978	17	22	23	21	17	3.1
USSR[a]	1959	—	26	26	22	26	3.7
	1979	—	30	29	23	19	4.0

Source: K. Schwarz, "Household Trends in Europe After World War II," in N. Keilman, A. Kuijsten, and A. Vossen (eds.), *Modelling Household Formation and Dissolution*, forthcoming.

[a] Data are for family households only.

among persons living alone, there was a marked increase in never-married males (22 percent of all persons living alone in 1980), an increase in the fraction of divorced or separated men (10 percent of the total in 1980), a decline in never-married women (28 percent in 1980), and a decline in widows (33 percent in 1960; 26 percent in 1980).

Single-parent family households

Among families and households, those headed by a single parent deserve special attention. In comparing figures for three different dates in six Western European countries, Roussel noted a slight but not insignificant increase in the proportion of single-parent families among all households. Around 1980, the highest proportion was found in the Netherlands (6 percent), followed by Switzerland and France (5 percent), Sweden and the Federal Republic of Germany (4 percent), and England and Wales (3 percent). The proportions appear to be higher in Eastern Europe. For Hungary, Kamarás reports one-parent families at 13 percent of all families in 1984 and 20 percent of families with children.[33] Women headed 82 percent of one-parent families in 1984 and men, 18 percent—up from 9 percent in 1960. In Poland, one-parent families increased slightly from 13 percent of all families in 1970 to 14 percent in 1984, when close to 90 percent of these families were headed by a woman.[34]

The proportion of one-parent families headed by women rose between 1960 and 1980 in almost all countries for which there are data; by about 1980, the proportions generally ranged from 80 to 90 percent. As might be expected, fewer of these lone mothers were widows by the later date: 21 percent in the Netherlands and 22 percent in Czechoslovakia, although still 75 percent in Italy. Many more were divorced or separated: 71 percent in Czechoslovakia, 66 percent in the Netherlands, 48 percent in Switzerland, 42 percent in the Federal Republic of Germany. Proportions of never-married mothers among these families were small, ranging only up to 13 percent in the Netherlands.[35]

The increase in divorce and cohabitation clearly has implications for the lives of children in Europe. Today's children are much more likely than their predecessors in the 1960s to experience the dissolution of their parents' marriage, living in a one-parent family, or being a child in a cohabiting union. From the little evidence available, it appears that apart from Denmark and Sweden, the one-parent situation is still generally temporary. However, children born to mothers living alone will, on average, spend more of their young lives in a one-parent family than those born in a marriage and children born to cohabiting couples are similarly more likely to spend part of their childhood with only one parent than those born to married couples. But the overwhelming majority of children still live with two parents: 83 percent of children under age 18 in the Federal Republic of Germany in 1981, for example.[36]

This completes the story of how the "standard" sequence of changes in fertility and family formation behavior has evolved so far during the course of Europe's second demographic transition. Mortality and migration trends have had relatively little impact on population numbers, but immigration has left a lasting imprint on the population composition of many Northern and Western European countries.

Mortality Differentials

Mortality changes are of secondary importance in the second demographic transition. However, long-term population trends are being shaped significantly by the impact on aging patterns of the continued and substantial increase in life expectancy everywhere except in Eastern Europe, by mortality differentials and changes associated with individual types of behavior and life styles, and by the growing gap in life expectancy between males and females.

Eastern Europe and the rest of Europe

Life expectancy at birth in Eastern Europe has historically been low by European standards, so it is not surprising that this is still the case. Male life expectancies of less than 70 years now occur almost exclusively in that region (see Table 8). What *is* surprising, perhaps, is that life expectancy gains have been so modest in Eastern Europe in the past few decades. In fact, male life expectancy has declined since the mid-1960s in Czechoslovakia and Hungary and since the early 1970s in Bul-

Table 8. Life Expectancy and Infant Mortality Rates in European Countries: 1950, 1970, 1984

Region and country	Life expectancy at birth (years)						Infant mortality rate (Deaths under age one per 1,000 live births)		
	Males			Females					
	1950	1970	1984	1950	1970	1984	1950	1970	1984
Northern Europe									
Denmark	67.8	70.7	71.5	70.1	75.9	75.9	24.0	11.3	7.8
Finland	62.9	65.9	70.4	69.1	74.2	78.7	43.5	13.2	6.5
Iceland	66.1	70.7	74.0	70.3	76.3	80.2	18.6	10.7	6.1
Ireland	64.5	68.8	70.1[a]	67.1	73.5	75.6[a]	36.0	16.6	10.1
Norway	70.8	71.2	72.9	74.4	77.4	79.6	20.2	10.4	8.3
Sweden	70.0	72.0	73.8	72.7	77.0	79.9	17.0	9.5	6.4
United Kingdom	66.2	68.7	71.1[b]	71.2	75.0	77.0[b]	23.8	18.5	9.6
Western Europe									
Austria	61.9	66.6	70.1	67.6	73.7	77.3	42.4	22.2	11.4
Belgium	65.2	67.8	70.0[a]	70.3	74.2	76.8[a]	40.8	17.6	10.7
France	63.6	68.3	71.3	69.3	75.8	79.4	34.2	12.7	8.3
Fed. Rep. Germany	64.6	67.4	70.5[b]	68.5	73.8	77.1[b]	40.6	20.2	9.6
Luxembourg	61.7	67.0	70.0[a]	65.8	73.9	76.7[a]	40.7	20.0	11.7
Netherlands	70.6	70.8	73.0	72.9	76.8	79.7	19.4	10.7	8.3
Switzerland	66.4	70.2	73.1	70.9	76.2	79.7	25.6	12.4	7.1
Southern Europe									
Albania	57.2	—	—	—	—	—	108.0	—	—
Greece	63.4	72.0	72.2[c]	66.7	76.1	76.3[c]	46.5	25.7	14.3
Italy	63.9	69.0	70.6[c]	67.5	75.0	77.4[c]	56.5	25.8	11.1
Malta	60.7	68.2	70.4	63.3	72.7	75.0	63.2	23.3	11.7
Portugal	56.3	63.7	68.9[a]	61.5	70.3	76.6[a]	87.4	48.7	16.7
Spain	59.8	69.7	72.5[c]	64.3	75.0	78.6[a]	59.1	17.2	10.5[e]
Yugoslavia	62.2	65.6	67.7[d]	65.3	70.4	73.2[d]	118.6	55.5	28.9
Eastern Europe									
Bulgaria	64.2	68.8	68.4[e]	67.7	73.5	74.4[e]	95	27.3	16.1
Czechoslovakia	60.9	66.2	67.1	65.5	72.9	74.3	78	22.1	15.1
German Dem. Rep.	65.1	68.9	69.5	69.1	74.2	75.4	72	18.5	10.0
Hungary	58.8	66.3	65.6	63.2	72.1	73.7	86	35.9	20.4
Poland	55.6	66.8	66.8	64.5	73.8	75.0	108	33.2	19.2
Romania	61.5	66.3	66.9[e]	65.0	70.9	72.5[e]	117	49.4	23.4
USSR	61	65	—	67	74	—	84	24.4	27.7[f]

Sources: Council of Europe, *Recent Demographic Developments*, 1983, 1986; P. Józan, *Recent Mortality Trends in Eastern Europe*, paper presented at the Conference on Health for All in the Year 2000: The Case of Europe, British Society for Population Studies, London, June 23, 1986; Monnier, "La conjoncture démographique" and personal communication, 1986; UN, *Demographic Yearbook*, various editions.

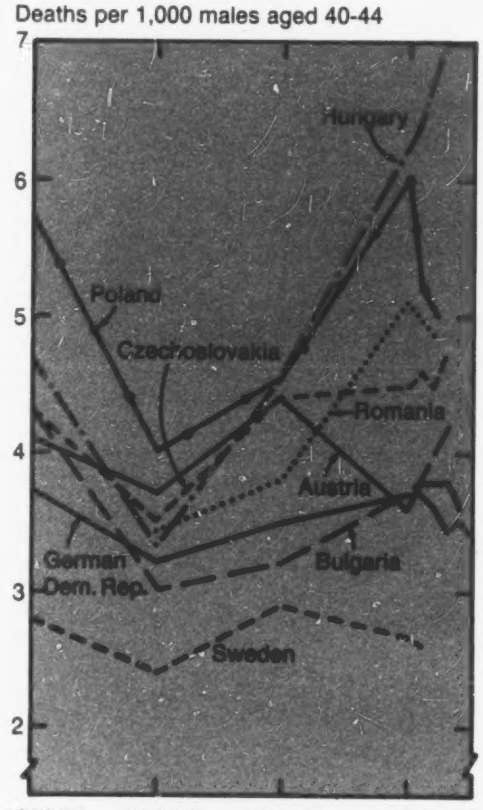
[a] 1981. [b] 1982. [c] 1980. [d] 1979. [e] 1983. [f] 1974.

garia and Poland.

Hungarian demographer Peter Józan suggests that differentials between Eastern Europe and other European countries should be viewed in light of the epidemiologic transition which occurred in Europe after World War II.[37] Infectious diseases (like pneumonia and influenza) and parasitic diseases (typhoid, diarrhea) were controlled, to be replaced by chronic degenerative diseases (heart disease, cancer, stroke) as the leading causes of death. This transition was completed by the late 1950s or early 1960s in most of Northern and Western Europe. The decline in adult mortality rates then leveled off, especially for males, while infant mortality rates continued to decline (Table 8). The plateau in adult mortality rates, or post-transitional stage, lasted some 10 to 15 years until mortality rates for heart disease and stroke in particular began to decline again with improvements in life styles and treatment methods. Life expectancy consequently rose further; a life expectancy of about 80 years at birth is now standard for women in Western Europe. In Eastern Europe, the post-transitional stage began later, in the mid-1960s or early 1970s. Infant mortality continued to decline, but adult mortality rates increased, mainly among males but also among women, and particularly above age 30. This can be seen in the trends in mortality rates for Eastern European males aged 40-44 in contrast to the trends in Austria and Sweden, as shown in Figure 10.

No single group of diseases appears to account for Eastern Europe's higher adult mortality (as well as infant mortality), although deaths from diseases of the circulatory system contribute substantially to the differential. A comparison of cause-specific mortality rates for 40-44 year-olds in 1964 and 1985 in Hungary reveals a rise in almost all the rates.[38] The rise was particularly marked for cirrhosis of the liver among both sexes, for lung cancer and ischemic heart disease among males, and ischemic heart disease and road accidents among females. This suggests that unhealthy practices, such as smoking, drinking, fat-laden diets, and careless driving exact a heavy toll in Hungary, and probably also in other Eastern European countries.

Figure 10. Mortality Rates for Males Aged 40-44 in Eastern Europe, Austria, and Sweden: 1950/54-1985



Sources: P. Józan, *Recent Mortality Trends in Eastern Europe* (Budapest: Central Statistical Office, 1986).

Sex differentials

A striking feature of European mortality patterns, as in most developed countries of the world, is the large differential in life expectancy between males and females. Female life expectancy now exceeds male life expectancy by more than eight years in several countries and differences of less than five years are rare (Table 8). Male mortality exceeds female mortality especially in adolescence and early adulthood and after age 60. In the European Economic Community countries of Western Europe, male mortality at ages 15-19 and 20-24 is generally two to three times that of females.[39] Illnesses account for about half of female deaths in these age groups and a quarter of male deaths. Traffic accidents and suicide account for the remainder and are largely responsible for the excess male mortality.

In the general population of Southern, Western, and Northern Europe, cardiovascular diseases (heart disease and stroke) and cancer account for well over half of all deaths. This proportion increases progressively from southern to northern countries.

International Migration: Europe on the Receiving End

Historically, Europe has been a theater of emigration, populating many parts of the globe. Now Europe attracts people and has all the potential to do so in large numbers. Wages and incomes in almost all European countries are much higher than in the origin countries of prospective immigrants, even in times of economic recession and stagnation. Moreover, most European countries have comprehensive social welfare systems that particularly benefit low-income groups, including immigrants. With the added impetus of free-flowing communication and easy transportation, millions of people from other regions, especially Third World countries, would settle in Europe, given a reasonable chance to do so. That this does not actually happen is due entirely to the elaborate systems of immigration control now in place in all European countries. These usually require a migrant to have residence and work permits before being allowed in. Although numerous aliens dodge these barriers to become "undocumented" or "illegal" immigrants—up to 1 million currently in Italy alone[40]—the systems of control are basically effective.

Important to note is that Eastern Europe is currently little affected by international migration. Large numbers of refugees left the region in the first 15 years after World War II. In the 1960s, temporary labor migration was organized within the Comecon (the six Eastern European countries, plus the USSR). Bulgaria, Poland, and Hungary were the sending countries and the German Democratic Republic, Czechoslovakia, and the USSR received immigrants. But this international migration within the region did not reach significant numbers, was not continued, and may not start again. Regarding the prospects for future international migration within or to Eastern Europe, Yugoslav demographer Milos Macura observes:

> "Such ideological concepts as proletarian internationalism and workers' solidarity, and the theory of socialism as a world system, seem to favor international migration, at least between socialist countries. On the other hand, there must be political or other considerations which rule out international migration as a viable proposition."[41]

The story of postwar international migration in the rest of Europe falls broadly into two periods—before and after the 1973 OPEC quadrupling of oil prices which touched off a worldwide recession.[42] From 1945 to 1973, emigrants still left several European countries for the classical destination countries: Australia, New Zealand, Canada, and the United States. Immigrants began arriving in Western Europe's major industrialized countries in the early 1960s. These early influxes peaked around the mid-1960s, subsided with the recession of 1967, and mounted again between

1969 and 1973.

The major migration streams began as planned recruitment of guestworkers. Before 1967 these flows originated mainly from Northern Mediterranean countries—Italy, Spain, Portugal, and Yugoslavia. After 1967 Turkey and the Southern Mediterranean countries of Algeria, Morocco, and Tunisia became more important. Countries of settlement also followed a time sequence. Switzerland, Belgium, and France received the first wave of recruited workers, followed by Austria and the Federal Republic of Germany, and then the Netherlands.

Other important streams flowed toward countries with a colonial past. France took in a million residents from Algeria in the early 1960s. The Netherlands received sizable numbers from Indonesia and Suriname, while the United Kingdom became the focus of immigration from newly independent Commonwealth countries. Belgium and Portugal saw influxes from their former African colonies.

The final important streams stem from the establishment of the Nordic Council in the early 1950s. The largest of these is from Finland to Sweden.

After the oil crisis, the pattern and context of European immigration changed. Economic recession and stagnation relegated the severe labor shortages of the 1960s to the past. The receiving countries tried to stimulate return migration and to stem the tide of immigration and the effect of family reunification preferences by imposing a variety of restrictions. Liberal regimes were replaced by restrictive policies.

But change was not confined to the industrialized countries of Northern and Western Europe. Conditions improved in the countries of Southern Europe, both politically—in Portugal, Spain, and Greece—and socioeconomically. They adopted some welfare state policies and thus became more attractive to their own populations. Dutch sociologist Rinus Penninx observes that therefore, the "rather massive return flows to Spain, Greece, Italy, and Yugoslavia" cannot be attributed solely to the deteriorating situation in Northern and Western Europe.[43] In fact, Greece, Italy, Spain, and Portugal became immigration countries themselves, attracting migrants from Morocco, Tunisia, and Egypt across the Mediterranean and from more distant countries like Pakistan and Iran.

Also in this period, immigration from former colonies remained important. Portugal absorbed several hundred thousand people from Angola, Mozambique, and Cape Verde, with little trace statistically since they are considered Portuguese citizens and not aliens. Similarly, France has taken in some 10,000 a year of its citizens from its overseas departments, like Guadeloupe. The United Kingdom and the Netherlands also received their share. A large fraction of the population of Suriname left the country in the two years before independence in November 1975 and again in the late 1970s as conditions deteriorated. The population in the Netherlands originating from Suriname or the Netherlands Antilles is now estimated at a quarter of a million. In the United Kingdom, the population originating from Pakistan and other Commonwealth countries is well over 2 million.

Recent migrants fall into four broad categories: those who circulate freely among the ten (as of 1985) countries of the European Economic Community and the five Nordic countries, and those from Northern Mediterranean, Southern Mediterranean, and Third World countries. Table 9 (page 40) shows the numbers in these streams and rates of return migration for Denmark, the Federal Republic of Germany, the Netherlands, and Sweden in 1976 and the early 1980s.

It is apparent that entry restrictions cut the inflows sharply after 1980. However, by 1984 in all but the Netherlands there was a pickup in flows from Third World countries; these are mainly family members joining immigrants who arrived earlier. As might be expected, return migration rates are generally lowest for immigrants coming from Southern Medi-

Table 9. Immigration, Emigration, and Return Rates of Foreigners in Denmark, Federal Republic of Germany, Netherlands, and Sweden, by Region of Origin and Destination: 1976 and 1980-1984

		European Economic Community and Nordic countries[a]			Southern Mediterranean countries[b]			Northern Mediterranean countries[c]			Third World countries[d]		
Country	Year	Immigration	Emigration	Return rate	Immigration	Emigration	Return rate	Immigration	Emigration	Return rate	Immigration	Emigration	Return rate
Denmark	1976	6,900	5,900	13.4	1,400	800	9.5	1,100	1,100	10.9	3,000	2,100	12.6
	1980	7,800	7,300	15.7	1,600	400	2.8	900	700	6.9	3,500	1,600	8.0
	1984	6,200	4,700	10.1	800	300	—	900	500	—	3,600	1,400	—
Federal Republic of Germany	1976	116,500	172,800	14.6	109,400	133,700	11.9	135,200	262,400	13.8	41,900	33,900	15.1
	1980	156,000	134,100	11.1	218,600	73,600	4.8	153,200	158,800	8.6	92,800	40,600	11.3
	1982	92,600	136,600	11.1	46,800	91,000	5.5	82,100	160,700	8.7	53,000	64,800	—
	1983	76,000	122,000	10.5	31,100	104,800	6.5	67,200	146,300	8.4	46,700	55,200	—
	1984	78,500	107,700	9.4	37,800	219,900	14.7	70,700	141,900	8.5	62,600	51,800	—
Netherlands	1976	14,500	8,500	7.5	15,700	4,500	3.8	2,400	4,300	8.8	17,400	5,300	—
	1980	16,700	10,000	7.4	27,600	3,600	1.9	2,000	2,000	4.5	40,100	6,500	4.3
	1982	12,700	9,700	6.9	11,700	7,300	2.9	1,400	2,200	4.9	17,900	6,700	3.7
	1984	12,100	8,800	6.1	8,900	8,800	3.4	1,200	2,100	5.0	16,300	7,200	—
Sweden	1976	22,100	12,200	4.8	2,900	180	1.8	2,300	1,900	3.2	10,400	2,100	5.0
	1980	16,200	13,600	5.4	1,700	140	0.7	1,700	2,200	4.2	11,900	2,400	3.3
	1982	7,400	14,500	6.3	1,300	150	0.8	1,200	1,700	3.2	9,800	2,000	2.7
	1984	8,400	10,000	4.9	1,200	190	0.9	1,100	1,100	2.1	11,900	2,000	2.5

Source: R. Penninx, *International Migration in Europe: Developments, Mechanisms and Controls*, paper presented at the DGBW/EAPS Conference on the Demographic Impact of Political Action, Bielefeld, March 11-14, 1986.

[a] European Economic Community countries (1985): Belgium, Denmark, France, Federal Republic of Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, United Kingdom; Nordic countries: Denmark, Finland, Iceland, Norway, Sweden.

[b] Southern Mediterranean countries: Morocco, Tunisia, Turkey.

[c] Northern Mediterranean countries: Greece, Italy, Portugal, Spain, Yugoslavia.

[d] Third World countries: Generally defined as all non-European countries (Turkey regarded as Asian by Sweden; European by the other three countries), minus North America.

terranean and Third World countries.

Besides immigrants, Europe, outside Eastern Europe, continues to receive refugees—32 percent of the 2.1 million refugees resettled or granted asylum in developed countries between 1980 and 1985, according to United Nations High Commissioner for Refugee records. At the beginning of 1985, there were close to 700,000 persons counted as refugees in 17 European countries, as shown to the right:[44]

Country of asylum	Refugees as of Jan. 1, 1985
Austria	20,500
Belgium	36,400
Denmark	8,500
Finland	500
France	167,300
Fed. Rep. Germany	126,600
Greece	4,100
Italy	15,100
Netherlands	15,000
Norway	10,000
Portugal	600
Romania	1,000
Spain	9,900
Sweden	90,600
Switzerland	31,200
United Kingdom	135,000
Yugoslavia	1,600
Total:	673,000

In recent years, several European countries have imposed stricter controls on refugees in an effort to stem the surge in Third World people who arrive claiming to be refugees but who do not qualify on grounds of political persecution. Denmark, for example, passed a law in 1985

Box 4. Federal Republic of Germany: Asylum-Seekers Pose a Problem

In 1986 the number of refugees seeking political asylum in the Federal Republic of Germany surged. Usually entering the country via the German Democratic Republic, there were 7,340 in June, 9,710 in July, and 9,241 already by August 22. The total for 1986 was expected to be over 100,000 and possibly break the record of 107,818 set in 1980.

Only some 16 percent qualify as politically persecuted persons under article 16 of the federal constitution: for example, Tamils from Sri Lanka, refugees from Cape Anamur in southern Turkey, and adherents of the Baha'i religion in Iran. This article, the only one like it in any other national constitution, was introduced following World War II to guarantee a place in the West for people wishing to leave Eastern Europe. Now most asylum-seekers come from Third World countries.

The FRG annually earmarks more than two billion marks to support refugees, pending a decision on whether they are eligible for asylum, which takes at least three years. Refugees not declared eligible for political asylum are subject to deportation. Refugees are not allowed to work for two years after arrival, a period that will now be extended to five years.

The government adopted measures to control the flood of uninvited refugees in August 1986. Announcing the measures at a press conference on August 27, Chancellor Helmut Kohl stated:

"I am not prepared to sit back and watch this development. For we want to remain a country . . . in which people who are truly persecuted for political reasons will find refuge . . . . However, we cannot permit this article of our constitution to be increasingly perverted and abused. It is simply impossible for the Federal Republic to grant asylum to anyone who is in economic distress but who is not politically persecuted. If we really want to help the deprived of the Third World, we must ensure that we put an end to the continuing abuse of our asylum laws. The federal government and the coalition partners have therefore implemented effective and far-reaching measures to protect the right to asylum."

Sources: "Cabinet Takes Measures on Asylee Problem," Press and Information Office of the Federal Government, news release, August 29, 1986; "West Germany Tightening Its Policy Toward Refugees," *The Washington Post*, August 16, 1986.

stipulating that refugees can be deported after two weeks if authorities determine that they do not meet this qualification and the Federal Republic of Germany also imposed stricter controls in 1986 (see box above).

Multi-Cultural Europe: The Minorities

The immigrant streams have had a tremendous impact on the ethnic, racial, cultural, and language composition of many European populations. In relative terms, Liechtenstein probably has the largest foreign population—36 percent of the total population in 1982—but there are also large proportions in Luxembourg (26 percent in 1981) and Switzerland (15 percent in 1985). Table 10 (page 42) shows the foreign percentage of the total population in 11 Northern and Western European countries and in Italy for several years from 1960 to 1985.

In most countries, the increase has been continuous, with the few decreases occurring mainly after 1980. It should be stressed that the foreign proportion of the total population is not a very accurate measure of the size of the immigration streams. Immigrants who arrive with citizenship are not counted as foreigners. Immigrants also disappear from foreign population statistics after naturalization. Country attitudes and regulations regarding naturalization vary. Some countries feel it will facilitate integration and grant citizenship quickly; others see it as a final

Table 10. Foreign Proportion of Total Population in Selected European Countries: 1960-1985

(Numbers in percent)

Country	1960	1970	1976	1981	1985
Austria	1.4	2.8	3.6	3.9	3.6
Belgium	4.9	7.2	8.5	8.9	—
Denmark	0.4	0.8	1.8	2.0	2.1
France	4.7	5.3	6.6	6.8	—
Fed. Rep. Germany	1.2	4.9	6.4	7.5	7.1
Italy	—	0.3	—	0.5	—
Luxembourg	—	—	24.0	26.3	—
Netherlands	1.0	2.0	2.6	3.7	3.9
Norway	0.7	—	1.8	2.0	2.4
Sweden	—	5.1	5.1	5.0	4.7
Switzerland	9.2	16.3	16.4	14.5	14.5
United Kingdom	—	—	2.9	3.9	—

Source: Penninx, *International Migration in Europe*.

step in a long process of adjustment and assimilation. In the early 1980s, naturalization rates measured as the proportion of the foreign population acquiring citizenship each year were high in Sweden (4.6 percent), Norway (3.6 percent), Denmark (3.6 percent), the United Kingdom (3.0 percent), the Netherlands (2.8 percent), and Austria (2.7 percent). Remarkably low fractions were registered for the Federal Republic of Germany (0.3 percent), Luxembourg (0.7 percent), and even in the countries with the longest postwar immigration history: Belgium (1.0 percent), France (1.3 percent), and Switzerland (1.6 percent).[45]

Foreign populations encompass a wide range of nationalities, but three or four usually make up a core. Sometimes these differ in religion from the host country and there are numerous instances of mosques converted from churches or synagogues or new mosques built and the amplified voice of the muezzin now calls followers to prayer in areas hitherto strictly Christian.

Of most interest demographically are the age structure, sex ratio, and fertility differentials between the foreign and host populations.

Sex ratio

As one might expect, males usually outnumber females in the foreign population. The number of females per 100 males is lowest at 70 to 75 in the Netherlands, France, and the Federal Republic of Germany. The ratios are higher in Scandinavia, especially counting only the ever-married. This yields ratios close to or over 100 in Denmark, Norway, and Sweden, though only 69 in Switzerland.[46] The difference reflects different approaches to family reunification and in the way residence and work permits are granted.

Fertility

Fertility trends among immigrant populations are difficult to establish and interpret. Changes in total fertility rates or levels of marital fertility may result from changes in policy. If, for example, a government decides that henceforth only women eligible for family reunification will receive residence permits, those who arrive will be mainly young brides or wives joining their husbands after a long separation. This will inflate the proportions of women at risk of conception and birth and consequently fertility levels. Conversely, if immigration from a certain region is greatly reduced, the proportion of newcomers in each age group will be small. Time and the processes of adaptation and adjustment will also have been at work and the combined result is likely to be a substantial drop in average fertility.[47] In short, the composition of immigrant groups by duration of stay, type of immigration, marital status, rural or urban origin, level of education, etc. is highly important in judging fertility levels and trends.

Available data suggest that fertility rates of immigrant groups drop markedly once immigration streams have dried up; total fertility rates of the early 1980s were generally lower than those measured in the late 1960s or early to mid-1970s. The rates are now below replacement level for virtually all groups in Western Europe originating from elsewhere in Europe, except for Turks. Among Turks in the Federal Republic of Germany and the Netherlands, total fertility rates have dropped from about 4.5 births per woman in the mid-1970s to less than 3.75. In the United Kingdom and the Netherlands, the rates of Caribbean women are now down to about 2.0. Indian-born women living in the United Kingdom had a total fertility rate of 4.3 in 1971, which was down to 3.1 in 1982. Only women of some North African (Moroccan) and Asian (Pakistani, Bangladeshi) groups still tend to give birth to more than six children on average.

Because of differences in age composition, marital status, and usually higher fertility levels, immigrant groups contribute more than their share to births in the countries of settlement. Figures in the mid-1970s were as follows:[48]

Country of settlement	Percent immigrant of total births	Percent foreign of total population
Luxembourg	42.9	24.0
Switzerland	26.4	16.4
Belgium	14.5	8.5
Fed. Rep. Germany	14.4	6.4
Sweden	9.6	5.1
Austria	7.4	3.6
Netherlands	5.0	2.6
Denmark	2.8	1.9

Comparable figures are not available for France and the United Kingdom, but the foreign contribution to the national birth rates at this time is put at well over 10 percent.

By the early 1980s, the proportions of immigrant births had gone up in some countries and down in others. This is partly related to the ethnic composition of the foreign population and, implicitly, fertility behavior, and partly to changes in definition. In Switzerland, for example, a law change of 1978 stipulates that a child born of a Swiss mother and a foreign father now acquires Swiss nationality at birth. Figures for the early 1980s were:

Country of settlement	Percent immigrant of total births	Percent foreign of total population
Luxembourg	38.5	26.3
Switzerland	16.5	14.5
Belgium	15.5	8.9
Fed. Rep. Germany	11.7	7.6
Sweden	10.2	5.1
Netherlands	8.1	3.7
Austria	7.3	3.9
Denmark	3.3	2.0

In contrast to fertility, immigrant populations still contribute less than their proportional share to total deaths. The younger age structure of foreign populations, return migration of older immigrants, and naturalization all contribute to this phenomenon.

Adjustment

European populations will no doubt adjust to the foreigners in their midst, for that "the guests have come to stay" can no longer be doubted. That was not the expectation or intention when the labor recruitment schemes of the 1960s were launched. But by now, multi-cultural Europe is a reality.

In Switzerland, for example, foreign children comprised 14 to 18 percent of all age groups below 22 at the beginning of 1983 and their presence is felt at all levels of schooling and training. There are marked differences by national origin. German children make up only 13 percent of all foreign children in Switzerland but 23 percent of foreign students in academic high schools. Italians, on the other hand,

Refugees seeking asylum in Switzerland. Europe is now tightening restrictions on refugees, as well as immigrants, in an effort to stem the influx of Third World people claiming to be refugees who do not meet the criteria of political persecution.

comprise 53 percent of foreign children but only 26 percent of the foreign-born among academic high school students.[49] Schools in the less privileged sections of larger Northern and Western European cities now frequently have a majority of foreign-born children among their pupils. Stories abound about the difficulties this creates. Governments differ in their views on how best to handle the situation. At first it was felt that training the young in their own language and emphasizing their separate cultural heritage would facilitate an eventual return to their home countries. Now that this prospect has faded, gradual integration and mutual adaptation of host and guest populations, coupled with increased emancipation, are seen as more realistic alternatives. One might say that the dilemma governments faced after 1973—a choice between politics stressing the "temporary" or the "permanent" nature of the immigration—has been solved by time.

Population Prospects

Seven European countries, in addition to the USSR, ranked among the world's 25 most populous countries in 1985: Federal Republic of Germany (No. 12), Italy (14), United Kingdom (15), France (16), Turkey (19), Spain (24), and Poland (25). The latest United Nations medium projections of 1984 show five still on the list in 2000, but only two in the year 2025: Turkey (16) and France (25). The UN comments:

> "According to the medium variant, Western Europe is expected to enter a phase of negative population growth around the year 2000, and Northern Europe around the year 2020, following a period of almost zero growth at the beginning of the twenty-first century. These low growth rates imply that Europe, which was still the third most populous region in 1980, following South Asia and East Asia, will have a population in 2025 which is about two-thirds that of Latin America and only one-third that of Africa."[50]

The medium variant projections indicate that while the world's population nearly doubles from 4.5 to 8.2 billion between 1985 and 2025, Europe's population (excluding the USSR) will inch up only 6 percent, from 492 to 524 million. Several countries will lose population, with the loss greatest in Northern and Western Europe. The population of the Federal Republic of Germany could well decline from 61 million in 1985 to 53 million in 2025.

The UN medium variant projections assume that Europe's total fertility rate will remain below replacement level until the end of this century and then rise to 2.05 births per woman in 2020-2025. Even the low variant projections assume some "recovery," although to a level still well below replacement.

How reasonable are such assumptions? Almost all European countries also make their own population projections, usually with rather sophisticated models. Current assumptions about future total fertility rates vary from as low as 1.4 to as high as 2.4. While some countries such as Belgium assume the current low fertility will be temporary, others see little prospect of a rise. Population projections, it should be recognized, are always strongly influenced by existing trends and current theories do not suggest than any one course can be taken as most likely. The only sensible attitude is not to be dogmatic and not to exclude the unexpected. However, those who argue that a rise in Europe's fertility cannot be excluded can nowadays expect to be greeted with derision. And, indeed, there is little to point to in support of that position. Of course, one might recall that in 1936, the eminent British demographer A.M. Carr-Saunders wrote of Europe:

> "With the possible exception of Russia, the net reproduction rate is falling everywhere and there is no sign that it is approaching stabilisation in any country. In North and West Europe and in Austria and Hungary where the rate is below unity, the population will presently begin to decline unless there is an immediate and considerable rise in fertility."[51]

The rise *did* occur, thanks largely to the war, the recovery, and economic expansion thereafter. And although, as British demographer Maurice Kirk has said so well, it would "take a very bold student to build comparable or analogous events into a medium-term perspective at any time,"[52] this is another illustration of the wisdom of not being too precise about what will happen.

Two scenarios

In light of the background to the second demographic transition described at the beginning of this *Bulletin*, one might suggest two scenarios that would ward off long-term population decline in Europe.

The first assumes that all countries pass through the "standard" sequence of changes in family formation. All countries experience the four shifts and the shift from the golden age of marriage to the dawn of cohabitation, in particular, is completed. Extramarital fertility becomes as normal as marital fertility. The trend toward individualism and independence continues, but after a generation of adjustment and adaptation, women and men decide (again) that having several children would enrich their lives, lead to greater self-fulfillment, and be in the best interests of society. Such a scenario takes into account the period effects in current trends, assumes that policies to support such changes will be accepted because of increasing concern about low fertility, and that the sequence sketched has not come to an end. In the "progressive" phase of the growth of demographic choice, many further options will be seen and chosen.[53]

There is not much concrete evidence to support such a scenario, but at least four points should be stressed.

The first is that it can easily be demonstrated how important extramarital fertility becomes as marriage wanes. Suppose the aim is a net reproduction rate of 1.00. That requires each 100 women to give birth to at least 100 girls. Under normal conditions, this will imply the birth of 106 boys, that is, 206 children in all. Allowing for the deaths of 3 percent of these children before they reach the mean age of childbearing, the number should be increased to 206 + 6 = 212. If one assumes that 6 percent of births are contributed by never-married women, then 100 women who marry must give birth to 212 − 12 = 200 children. With varying proportions of women marrying, one obtains the following requirements per ever-married woman:

90% = 2.22 children per woman
80% = 2.50 children per woman
75% = 2.67 children per woman
60% = 3.33 children per woman

However, the 3.33 children per ever-married woman required when 60 percent of women marry drops to 2.65 per ever-married woman if 25 percent, rather than 6 percent, of the 212 children are contributed by never-married women and to 2.12 when 40 percent of all children are born out of wedlock, as now in Denmark and Sweden.

This is still considerably higher than current total fertility rates in Europe, but not inconceivable if one notes—and this is the second point—that there are many survey results which suggest that desired family size has not declined so dramatically as actual fertility rates.[54]

The third point relates to the character of the second transition. Shifts in norms made possible by the development of the welfare state have allowed individuals and couples to make a choice of fertility behavior "based on their own assessment of available options of 'satisfaction' or 'happiness'."[55] That assessment of options may change now that economic recession and the burden of increasing proportions of elderly are forcing many Northern and Western European governments to step back from all-encompassing social security programs. It is possible, for example, that societies concerned about the "feminization of poverty" which frequently follows divorce or separation will put more emphasis on marital stability. There appears to be increasing reluctance to pay taxes that go toward supporting individuals who have chosen to divorce, separate, or remain unmarried.

The fourth point stems from the growing concern about current population trends. If these trends continue, democratically elected governments could find a majority of their populations in favor of direct and indirect policies to stimulate and enable couples to have more children.

The second scenario would be much simpler. It assumes that immigration becomes a major component of population growth, more so than before 1973. Conflict and political instability elsewhere in the world swell the numbers of people seeking political asylum and/or a better life in Europe, more particularly in northwestern Europe. Admittedly, the recent tightening of restrictions suggests that a resumption of large-scale immigration is unlikely to be acceptable. Also, if arriving "refugees" claiming eligibility for political asylum are motivated mainly by economic considerations, they are not warmly welcomed. But in the past, at least, many European countries have allowed refugees and others to enter on broadly defined humanitarian grounds; such politics were usually widely supported, and could be again.

When all is said and done, however, the only reasonable expectation is that Europe—at least most of it—will inevitably see birth and death rates converge at low levels, followed by population decline. Austria, Denmark, the Federal Republic of Germany, and Hungary, where births already fell short of deaths in 1985, will very soon be joined by Belgium, Bulgaria, the German Democratic Republic, Italy, Sweden, and the United Kingdom, where natural increase was less than 0.15 percent in 1985, and then by others (see Table 2, page 13). At the same time, the population will age further. According to the 1984 UN medium variant projections, the proportion of Europe's population aged 65 and over will increase from 13.1 percent in 1985 to 18.4 percent in 2025, while the proportion under age 15 declines from 22.4 to 18.3 percent. This shift will be most marked in Western Europe: nearly 21 percent of the region's population will be 65 and over in 2025 and only 16.8 percent under age 15, and the changes will be still more striking in some countries (see Figure 11).

The Population Debate

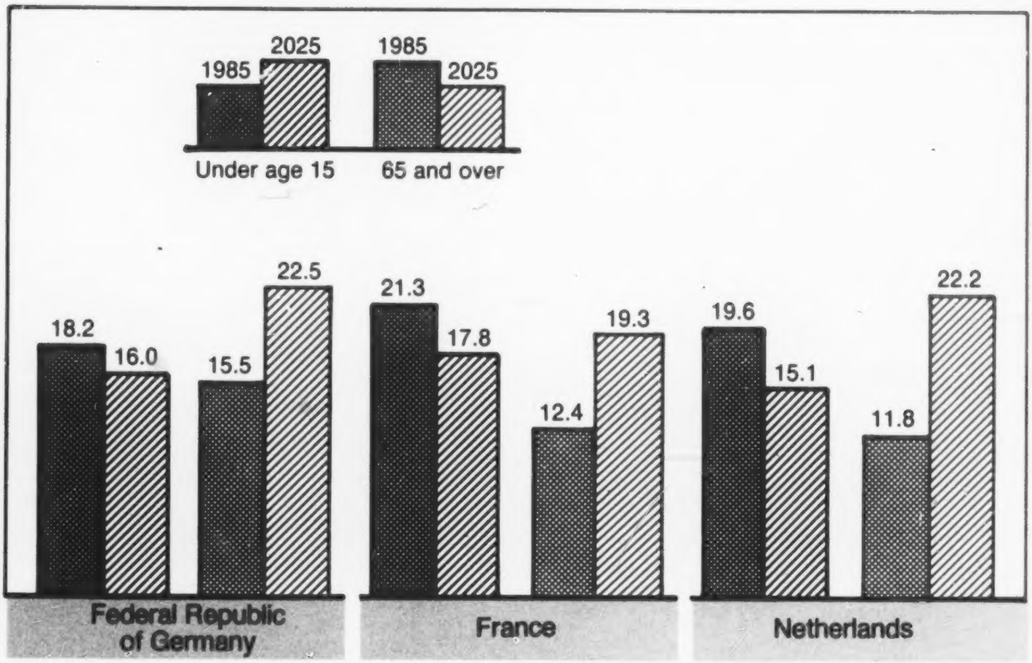
Two quotes from among countless articles appearing in the press since the mid-1970s illustrate the extremes in the public debate over population trends that grips Northern, Western, and Southern Europeans.

Writing for the opinion page of *Le Monde*, December 14, 1978, former French prime minister and rightwing politician Michel Debré warned:

> "But the policy setters, ministers, elected officials, journalists, teachers, priests have a responsibility: to make it understood that in France everything is at stake with this catastrophe of the decline in births—pension plans, social legislation, economic prosperity, free-

Figure 11. Population Under Age 15 and 65 and Over in Three Western European Countries: 1985 and 2025

(Percent of total population)



Source: UN, *World Population Prospects: Estimates and Projections as Assessed in 1984* (New York: 1986), medium variant.

dom . . . . Continuation of the 1978 birth rate could cause the population of France to fall to 20 million inhabitants in five generations. And you, gentlemen, are doing nothing! . . . All the mistakes that can be made in internal affairs or external affairs would be attenuated by a strong birth rate. They become fatal when the birth rate slumps. Fatal for the nation. Fatal for men and women. Fatal for their liberties."

At the opposite end of the pole, Vera Slupik attacked what she labeled "Brainwashing with population policy" in the Federal Republic of Germany in a 1981 issue of the feminist journal *Emma:*

> ". . . as the notion of women which these childbirth-technocrats have has . . . not changed very fundamentally, we should keep a watchful eye on these characters. All attempts to influence the decision of women for motherhood must again and again be confronted with the demand for self-determination; in concrete terms: my belly is mine!"

It is not women who express concern over fertility, Slupik continues, and why should they? "Why should we be concerned about the decline in the birth rate of the Federal Republic and Europe, given the fact that our planet" is already overfull, women in Third World countries are being forced to undergo sterilization, and the FGR even refuses to let in a few hundred thousand refugees from Afghanistan, Sri Lanka, and Turkey. In her view, the population debate is a male ploy to send women back to the kitchen, and if she then has children, so much the better for the man, "it gives him the certainty that you will stay with him."

The debate reflects opposing views on collective versus individual interests, the concept of the nation, conservative versus progressive approaches to demographic change, and the likely socioeconomic consequences of aging populations.

Proponents of pronatalist measures

Proponents of government action to raise fertility seem propelled by three broad areas of concern.

The first is concern for the continued vitality of national populations that do not replace themselves: no children, no future, is the key phrase. They cannot believe that people can be so self-centered and uncommitted to the future of the nation that nurtured them. The shift to independence, particularly of women, is viewed as detrimental to family life and the socialization of children, a kind of collective suicide.

The second concern is that a nation's position as a world or regional power will wane and Europe's cultural identity disappear as the populations of nearby non-European countries grow much faster. Mindful of the nationalist-socialist past, the power issue is cautiously expressed as no longer being able to accept national and international responsibilities. Also, European countries must still guard against military aggression and with too few young men, young women will soon have to be recruited to make up the necessary numbers of soldiers. And as newcomers with different religions and customs take over the places left empty in dwindling populations, Europe's cultural heritage could be lost in the resulting pluralistic societies.

The third concern is for the future of the welfare state. The increase in numbers of dependent elderly relative to numbers in the productive working ages that comes with low fertility could overwhelm the elaborate systems of pensions, health and unemployment insurance, benefits for the poor, etc. built up in the 1960s and 1970s to redistribute resources. Some population growth is also necessaary to ensure a young, growing labor force to absorb, use, and develop technological innovations and generate economic growth.

Opponents of pronatalist measures

Opponents aim their barbs at all these concerns.

They dismiss as exaggerated the specter of Europe as a decrepit society of ruminating octogenarians. Leaders and innovators always form a fraction of the total population and Europe has nothing to fear so long as it invests sufficiently in its young. The aim should be to increase the fraction of each birth cohort that receives university or technical education. The anxiety to maintain a society or nation is reminiscent of the fascist period and detrimental to the necessity of achieving greater European integration. The shift to independence is a blessing. Relieved of superstitions and the hold of the churches, people can live a humanistic life. Governments must observe fundamental human freedoms and not interfere unnecessarily in the lives of their citizens.

Opponents also attach no special value to their own cultures, welcome an open pluralistic society, and fiercely oppose racial discrimination. More generally, they consider it Europe's duty to let others share in its resources and not to stimulate population growth when this clearly is a serious problem at the global level. Moreover, economic resources rather than military resources or population size determine a country's international standing. Economic integration is a much more effective way to maintain Europe's international position than stimulating the birth rate.

They also question whether labor forces beset with the high unemployment that plagues Europe's market economies should be encouraged to grow. With modern technology eliminating jobs, workers are encouraged to work shorter hours, part-time, or retire early and immigration is halted, so why should we have more people? As long as labor productivity increases, there is no problem of funding social security systems. And are not economists themselves divided about the likely consequences of population decline? The opponents admit that population decline requires adaptation but insist that it is not catastrophic. It is better to accept decline and the supremacy of individual over collective interests than to try to reverse the valuable process of emancipation—more equal rights for women, for example—which may have generated the decline.

As a rule, opponents of pronatalist measures identify more with the sociocratic than the technocratic view of society, favor postmaterialism over materialism, progressiveness over conservatism, and politically place themselves to the left rather than right of center.

Political response

Population concerns are more recognized and acknowledged in some European countries than in others. In France, with a century-long history of concern about population stagnation, the government probably has a majority of the population behind its strong pronatalist stand. In the Netherlands, a large majority shares the official view that an end to natural population growth should be welcomed and the ultimate goal should be a stationary population smaller than at present.[56] But in all Western European countries there are sizable minorities which oppose the majority views. This makes the population issue very unattractive to politicians. They risk losing votes if they propose measures bound to displease some groups in populations of different ages, sexes, marital status, and family life stages and usually there is no strong lobby to please in order to gain votes.[57] As a result, governments of Europe's free market economies move cautiously. In official UN population inquiries, they are likely to declare themselves satisfied with current fertility levels and, at any rate, to consider intervention inappropriate.[58] They are caught "between freedom, equality and solidarity"[59] and find it difficult to choose.

This was evident in the fate of a French initiative at an April 1984 meeting of Ministers of Social Affairs and Employment of the European Economic Community. The French Minister sought support for the proposition that community-level action was required to deal with Europe's demographic situation. He raised the specter of lost influence as the share of the then ten EEC countries' population in world population shrank from 8.8 percent in 1950 to 2.3 percent in 2025. But only Luxembourg dared support the proposal. That a few days later the European Parliament *did* pass a resolution along the proposed lines was of little significance. However, an interesting report on demographic trends in the EEC was published two years later.[60]

Public debate about population issues appears to play less of a role in determining policies in the centrally planned economies of Eastern Europe. At least this topic is not mentioned in studies of population policies in the region by U.S. researchers Henry David and Robert McIntyre and by Macura.[61] Macura stresses that it would very wrong "to suggest that the development of policies affecting population in European socialist countries was a uniform process," but it is evident that governments acted more immediately and decisively in response to demographic trends than elsewhere in Europe. Macura observes that ideologically, "socialist optimism tends to generate policies" which favor population growth. The assertion is that a socialist society can overcome relative overpopulation and provide for a rapidly growing population. However, Macura points out factors that are also part of the ideological setting but which would tend to reduce fertility: elimination of wage differentials, sexual equality, important status of women in society and the labor force, shift to urban areas, and legalized abortion. The emphasis on the right to decide freely on the number and spacing of children also tends to reduce family size. Arguments now used to justify pronatalist policies are akin to those put for-ward in the rest of Europe. They refer to the deteriorating age structure and the likely detrimental effects of a further aging of the population. Thus, they are basically planning-oriented.

Pronatalist Policies and Their Effects

Eastern Europe

When the fertility of all Eastern European countries except the German Democratic Republic fell precipitously during the 1950s and early 1960s, the official reactions were prompt. Since the mid-1960s, all countries of the region have taken measures intended to stimulate fertility. These can be divided into two groups.

The first measures are simply to make it more difficult to contracept or to resort to induced abortion. In centrally planned economies, the import, production, and distribution of contraceptives can be controlled rigidly, and re-restriction of legal abortion will have an immediate effect. Romania's abrupt cutoff of legal abortion (and imported contraceptives) in October 1966 was the most striking example of this approach (as described in the box on page 30). Thousands of women intending to resort to abortion were clearly caught unexpectedly and forced to carry their pregnancies to term. The birth rate soared, but declined again in subsequent years. The Romanian State Council claimed that the step was taken for both health and demographic reasons, but demographic aims were no doubt paramount.

The second group of measures aims, as Frejka puts it, to make children "a more attractive proposition."[62] They are designed to make it financially possible for couples to begin childbearing early and to ease the financial burdens of childbirth and early childrearing. In many countries of Eastern Europe, the focus has been on second and third births, the births that are crucial to bringing national fertility up to replacement level. In 1980-81 the child allowances for two and three children as proportions of the average monthly industrial wages were: 12 and 34 percent in Bulgaria; 18 and 53 percent in Czechoslovakia; 4 and 9 percent in the German Democratic Republic; 21 and 35 percent in Hungary; 9 and 16 percent in Poland; and 19 and 30 percent in Romania.[63]

Since 1964 in Czechoslovakia, women with five or more children are entitled to their old-age pensions at 53, those with three or four children at 54, those with two at 55, those with one at 56, and the childless at 57. Also in Czechoslovakia, newlywed couples receive low-interest loans up to 30,000 crowns (U.S.$5,200 as of early 1987); 2,000 crowns are written off the debt at the first birthday of the first child and 4,000 crowns at the first birthday of each subsequent child.[64]

Besides child allowances and marriage loans, pronatalist economic incentives in Eastern Europe include birth grants, full-paid maternity leave up to 26 weeks in some countries and subsidized leave thereafter (up to the child's third birthday in Hungary), subsidized nurseries and kindergartens, educational and transportation subsidies, tax rebates, rights to housing dependent on family size, free medical care during pregnancy and delivery, etc.

Northern and Western Europe

Some countries of Northern and Western Europe have also attempted to generate favorable conditions for fertility decisions, or to make society more *kinderfreundlich* (child-friendly), most notably France. A year-long government campaign to "Ouvrons la France aux enfants" (Let us open France to children) was launched in May 1985. Industrial leaders, labor organizations, politicians, etc. were exhorted to build for families, construct playgrounds, do everything to make parents feel children were welcome. There have been similar private campaigns: "La France a besoin d'enfants" (see photo). It is also in France that successive presidents and

Il paraît que je suis
un phénomène
LA FRANCE
A BESOIN
D'ENFANTS.

France has been the most aggressive of countries outside Eastern Europe in campaigns to raise fertility.

prime ministers (Giscard d'Estaing, Mitterand, Chirac) have been most outspoken about population concerns.

Many countries in the region have established national bodies to explore and report on the possibilities for and likely effects of economic measures to ward off imminent population decline. But although most countries already provide comparatively generous maternity benefits and child support, in only a few cases can these be considered explicitly pronatalist measures. France is the most clearcut example, but Austria, the Federal Republic of Germany, and Sweden can—with some imagination—be put in that category. The hesitation stems not only from the political hazards described, but also the large expenditures involved and uncertainty about the effects.

Effects of pronatalist measures

The effects of population policy measures are difficult to ascertain. They seldom occur in isolation, usually several measures are introduced at the same time, general social welfare policies may interfere (to bolster family resources in low-income families, for example), and benchmark data are difficult to establish.[65] In a recent comparison of the effects of child allowances in 28 countries as of 1979, Olivia Ekert concluded that government child support at the level of France, covering 16 percent of child costs, increases average completed family size by 0.2 of a child; full coverage of child costs would raise the average number of children per woman by about 0.5.[66]

Hungarian demographer Andras Klinger feels that the strenuous pronatalist efforts of Hungary to the mid-1970s—strengthened economic incentives and denial of abortion on request to married women with fewer than two children in 1974 (coupled with a campaign to promote more effective contraception)—meant that at best "a reduction of fertility could be avoided in the case of these cohorts [women born 1953-58], although it could not raise fertility to replacement level."[67]

Charlotte Höhn and Herman Schubnell looked at the effects of population policy measures in three countries of Western Europe (Austria, France, Sweden) and four in Eastern Europe (Czechoslovakia, German Democratic Republic, Hungary, Romania).[68] Except for France, they found no long-term effects on fertility in Western Europe. The findings were similar in Eastern Europe. In the latter region, they point out, population policy measures are influenced by government measures in other areas—the economy, tax policies, labor market, social policy—so their effects, certainly of any one measure, cannot be singled out. They conclude:

> "Even extensive and costly pronatalist measures hardly ever lead to spectacular long-term effects on the average number of children of female generations, if we except short-term positive effects. . . . They may, however, contribute toward slowing down the fertility decline and, in particular, improving the social situation of parents and their children."

The only spontaneous, at least unintended, rise in births registered in Europe in recent years has occurred in Poland, beginning in the late 1970s and peaking in 1983, at a time of social and economic crisis. Kondrat reports that per capita income declined 30 percent between 1979 and 1982.[69] This put luxury goods far beyond the reach of many families and some demographers predicted that this would weaken their attraction in comparison to children and birth numbers would rise. The rise did in fact happen. But Kondrat concludes that it was an "unexpected and unintended effect" of the state's social policy aimed at the "protection of families, especially those in a particularly difficult situation." Other factors are likely to have been at work as well (see box).

It is also worth noting that the USSR is so large and heterogeneous that both antinatalist and pronatalist measures appear to be called for. In fact, Tass reported on January 22, 1987, that in the predominantly Muslim Soviet Republic of Tadzhikistan a campaign has been launched to reduce the fertility rate (5.8 births per woman, compared to 1.9 in the Russian Republic about 1980). Benefits available to large families elsewhere are to be withdrawn in this Central Asian republic to alleviate the problems caused by rapid population growth.

Making the Gift of a Baby to the Pension Funds?

In 1986 the influential Germany weekly *Der Spiegel* ran a series of articles under the heading *Den Alterskassen ein Baby schenken?*, which translates roughly as above. It sums up Europe's demographic dilemma well. Collective and individual interests do not seem to coincide. The transition to individualism appears to have led to an extended period of below-replacement-level fertility, population decline, and an age structure that will in the long run make full funding of old-age pensions virtually impossible. Yet it is difficult to imagine people having babies to please the pension funds and economic incentives, even at the level offered in France and some Eastern European countries, appear incapable of overcoming individualistic desires and raising fertility to replacement level. Relying on immigration to adjust age structures is practically out of the question. All countries of immigration have taken effective measures to end the influx and increasingly aim at rapid integration of the current minorities. In the Heidelberg Manifesto, published in *Die Zeit* (February 5, 1982), 15 prominent German scholars went further, arguing for a return of the foreigners to their home countries on social and ecological grounds. Current French Prime Minister Jacques Chirac similarly asserted in 1984: "Their num-

Box 5. Poland: Rising Birth Rates In a Time of Crisis

Political, social, and economic events often have unexpected consequences for demographic trends, as in Poland during the early 1980s. Numbers of births rose sharply, particularly in urban areas, from an annual average of 600,000 in 1971-1975 to 676,000 in 1976-1980 and almost 701,000 in 1981-1983. Some 720,000 children were born in 1983, the highest total in 22 years. The numbers then declined to 699,000 in 1984 and 678,000 in 1985.

The upturn in births is partly an "echo" of Poland's postwar baby boom of the 1950s, which has increased the number of women now in the childbearing ages. However, Poland's total fertility rate, which is unaffected by numbers of women in the fertile ages, is also one of the highest in Europe. In 1983 it reached 2.40 births per woman, just behind the rate of 2.74 in Ireland in that year (see Table 5, page 19).

The fertility rise took place during a time of social, political, and economic crisis, highlighted by the formation in 1980 of the independent Solidarity trade union to push for reform, the suppression of Solidarity and declaration of martial law at the end of 1981, and subsequent imposition of economic sanctions by NATO member countries in an effort to force the Polish government to lift martial law and start a dialogue with Solidarity and the Roman Catholic Church of Poland. Since living standards were deplorable in these years, the fertility rise must have reflected changing attitudes toward life. The major causes of these changes appear to be:

- In times of social disintegration, people fall back on the family.
- There was a lack of confidence in the stability of government policy on matters such as maternity leave and child support.
- Official Roman Catholic Church views on the sanctity of the family and prohibition of artificial contraception and abortion gained influence, due to the important role the church has played in Polish society during and since the crisis.
- Due to acute shortages of consumer goods, any spare income could be devoted to new babies.
- The crisis fostered a renewed pride in the nation.

Source: Janice Jozwiak and Teresa Slaby, "Poland: Unexpected Birth Rise in a Time of Crisis," *Demos*, Vol. 2, No. 1 (January 1986).

bers will have to decline."[70]

What then is the answer to the predicament? Most countries will probably follow the old maxim: If in doubt, do nothing; wait and see. After all, the art of governing is not to do anything until action can no longer be avoided.

Another approach is to try out new, more imaginative measures to raise fertility and have them ready when needed. Thinking in this direction is developing rapidly. So far no serious proposal seems to be compatible with the shift to individualistic values. But a recent proposition by Population Council demographer Paul Demeny is certainly imaginative.[71] He proposes to relink fertility behavior and economic security in old age. The pronatalist institution he sees would "earmark a socially agreed-upon fraction of the compulsory contribution from earnings that flow into the common pool from which pay-as-you-go national social security schemes are now financed and transfer that fraction to individual contributors' live parents as an additional entitlement."

It is easy to make a long list of reasons why this proposal has no chance in the world of being implemented. But then, in demographic matters the unexpected sometimes happens. ☐

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Population, Resources, Environment: An Uncertain Future

By Robert Repetto

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Abstract--The links between population growth, resource use, and environmental quality are too complex to permit straightforward generalizations about direct causal relationships. However, rapid population growth has increased the number of poor people in developing countries, thus contributing to degradation of the environment and the renewable resources of land, water, and nonhuman species on which humans depend. Demands of the rich industrial countries have also generated environmental pressures and have been foremost in consumption of the socalled nonrenewable resources of fossil fuels, metals, and nonmetallic minerals. On the other hand, population and economic growth have also stimulated technological and management changes that help supply and use resources more effectively. Wide variations in the possible ultimate size of world population and accelerating technological change make future interrelationships of population, resources, and the environment uncertain as well as complex. But those interrelationships are mediated largely by government policies. Responsible governments can bring about a sustainable balance in the population/resource/environment equation by adopting population and development policies that experience has shown could reduce future population numbers in developing countries below the additional 5 billion indicated in current United Nations medium projections, coupled with proven management programs in both developing and developed countries that could brake and reverse the depletion and degradation of natural resources.

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POPULATION BULLETIN
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A dust storm in Kenya. Rapid population growth in developing countries and resource demands of rich developed countries have revived ancient concerns about the interactions of population, resources, and the environment. Though the future of these interactions is uncertain, government policies to stem population growth and strengthen resource management could help relieve further inevitable pressures on resources and the environment.

Population, Resources, Environment: An Uncertain Future

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Dr. Repetto wishes to thank James Joslin for able research assistance and Katherine Harrington for help in preparing the manuscript for this Bulletin.

Events of the past two decades have revived a vigorous debate about the connections between population pressures and resource scarcities. Many of the events that precipitated this debate were not directly demographic in origin: for example, oil price shocks and the rise and decline of the Organization of Petroleum Exporting Countries (OPEC) cartel, inflation and disinflation in the world economy, fluctuations in world weather and agricultural production, and changes in reigning political ideologies. However, such events have again called attention to basic questions about population and resource interactions. What are the economic and environmental consequences of rapid population growth in poor countries and of incipient population decline in rich countries? What are the limits that life on a finite planet impose on economic and demographic expansion and progress? What, if anything, should be a responsible government's response to promote the welfare of its current and future citizens?

This *Bulletin* attempts to show that there are no easy answers to these questions. Both with regard to the past and outlook for the future, the connections between population growth, resource use, and environmental quality are too complex to permit straightforward generalizations about direct causal relationships. Further, many of these connections are manifested only at the local level and may be missed when the perspective is regional or global, where much of the debate has focused.

Only the demographic record to date is clear. World population has doubled from 2.5 billion in 1950 to 5 billion in 1987, with over 85 percent of that growth occurring in developing countries. Rapid population growth coincided with efforts to raise living standards in developing countries and created pressures on the financial, physical, and human resources of those countries. These pressures have evidently exacerbated the problem of alleviating poverty in developing countries and thus have contributed to degradation of the environment and the renewable resources of land, water, and nonhuman species on which humans depend. However, the demands of rich industrial countries have also often led to environmental stress and have been foremost in drawing upon the world's so-called nonrenewable resources: fossil fuels, metals, and nonmetallic minerals. On the other hand, population and economic growth have also stimulated technological and organizational innovations that show that resources can be supplied and used more effectively.

The future interaction of population expansion and resource use is uncertain. The United Nations currently estimates that although the rate of growth has slowed, world population numbers could double again to reach just over 10 billion before stabilizing late in the next century, with all but a small fraction of that increase again coming in developing countries. Such long-range projections are speculative, however, and the actual ultimate size of world population could vary substantially, depending on social, economic, and political conditions. Similarly, in a world of accelerating technological change, future resource demands and supplies cannot be predicted with confidence even ten years ahead.

Despite this uncertainty about future trends in population growth and in resource supplies and demand and the complexity of their interrelationships, experience has shown that there is room to maneuver. The interrelationships are mediated by government policies and by such social institutions as family, community, and cultural traditions and practices. By adopting wise social and economic policies now, responsible governments can make the difference.

Population growth rates can be braked faster and fewer numbers added in developing countries than now projected by programs shown to have worked in reducing high fertility: basic health, family planning, and education services made accessible to all, coupled with emphasis on development strategies that expand employment opportunities as fast as possible and thus provide escapes from poverty. Similarly, proven management programs in both developing and developed countries can brake and reverse the depletion and degradation of natural resources.

In exploring these issues, this *Bulletin* begins with a look at the long history of concerns and debate about population growth and resources.

Intellectual Background

Concerns about population pressures on resources are more ancient than most people realize. Chinese writers at the time of Confucius inquired into the right balance of population and land to bring the greatest prosperity to the State. Plato estimated the ideal population of a Greek state, one that would be large enough for security and self-sufficiency but small enough to preserve civic cohesion, to be 5,040 landholding households.[1]

Classical and neoclassical economists

Over centuries of debate, prevailing opinion concerning population growth's effects has shifted back and forth with ideology and economic conditions. The classical economists—notably Adam Smith, Thomas Malthus, and David Ricardo—were reacting to the arguments of earlier Mercantilist writers of the 16th to 18th centuries. Mercantilists such as Jean Bodin, reflecting the rise of nation states and vigorous commercial expansion, believed, "One should never fear there being too many subjects or too many citizens, seeing that there is no wealth nor strength but in men."[2]

Malthus and other classical economists, writing at the start of the 19th century when accelerating population and industrial growth were raising demands for food faster than English agriculture could respond, saw real wages falling and food imports rising.[3] They emphasized the limits that scarce farmland imposed on agricultural expansion, arguing that applying ever more labor and other inputs to a fixed land base would inevitably encounter diminishing returns, reducing output per worker. The classical economists also stressed the tendency for population to rise with any widespread improvement in living standards, through lower mortality rates and

"Wivenhoe Park, Essex," by John Constable (1776-1837). Writing in England at the start of the 19th century, Thomas Malthus and other classical economists argued that a fixed land base imposed limits on meeting rising food demands generated by accelerating population and industrial growth.

earlier marriage. In their view, this tendency continually depressed real wages toward a subsistence level while rents to landowners grew.

This stress on the inherent limits to the availability of natural resources and consequent diminishing returns to other inputs and rising production costs is still the core of contemporary Malthusian perspectives. However, these concerns now encompass scarcities not only of agricultural land but also of exhaustible resources such as fossil fuels (oil, coal, natural gas) and limits on the capacity of global life-support systems to withstand human disruptions.

Most contemporary rebuttals of Malthusian viewpoints repeat objections that were first raised at least 150 years ago. The utopian Condorcet argued in 1795 that scientific advance would offset diminishing returns: "New instruments, machines, and looms can add to man's strength and improve at once the quality and accuracy of man's productions, and can diminish the time and labor that has to be expended on them . . . . A very small amount of ground will be able to produce a great quantity of supplies . . ., more goods will be obtained for a small outlay, the manufacture of articles will be achieved with less wastage of raw materials and will make better use of them."[4]

Marx argued that Malthus' argument was a rationale for class exploitation. As he saw it, the real cause of depressed wages was the increasing concentration of resources in the hands of capitalist proprietors. Nassau Senior asserted that improved living standards for the poor would not lead them blindly to expand their numbers but rather to restrict their fertility in order to preserve the gains they had realized.[5]

The views of 20th century neoclassical economists reflect the enormous 19th century expansion of land under cultivation beyond the borders of Europe, the diminished importance of agriculture in modern industrial economies, and a century of rapid technological progress and declining relative prices for resource-based commodities.

Neoclassical economic thought puts invested capital in place of natural resources at the center of attention. While still pessimistic about the consequences of rapid population growth, most neoclassical economists saw as the danger of diminishing returns that the labor force would outgrow the stock of invested capital, so that workers would be employed, if at all, only at reduced real wage rates. However, since invested capital could be increased indefinitely through savings, output could always increase along with population, and—with the help of technological progress—outstrip it.

Neoclassical economic thought has discounted even natural resource constraints imposed by nonrenewable minerals. It emphasizes the adaptability of modern economies through market-induced substitution and innovation. If some resource costs rose, businessmen would reduce costs by substituting other materials and labor or capital. Consumers would also reduce purchases of commodities that use the resource intensively in favor of other kinds of goods. If the resource scarcity were local, rising prices would make imports from other regions more attractive and trade patterns would shift. Neoclassical economic models imply that if substitution possibilities remain sufficiently great, income per capita can be sustained with a rising population even if the resource is ultimately exhaustible.[6]

Technological change has understandably come to the forefront of modern economic thought. There is ample evidence that increasing resource scarcities, signaled by rising relative prices, induce innovators to develop and introduce new production processes. The original Industrial Revolution is often portrayed as a series of technical innovations induced by successive resource bottlenecks. For example, the depletion of English charcoal supplies hampered the ironmaking industries until Abraham Darby, who had used coke to smelt copper, developed a way to produce good quality iron in a coke oven. The resulting jump in demand for coal created another bottleneck: the need for power to run the pumps that kept coal mines dry. One English colliery in the early 18th century used 500 horses on the pumps. Newcomen's steam pump met the need, but led to a severe transport bottleneck as output expanded. This was resolved eventually by Stephenson's steam locomotive running on iron rails.[7]

Neoclassical economists also emphasize the ability of markets to adapt to resource scarcities over time. Anticipated future scarcities induce businessmen to hold supplies off the market in expectation of higher future prices, and to spend more to discover and develop new supplies. Even though those still unborn exert no market influence directly to preserve resources for their use, businessmen's anticipations of future demand represent them indirectly by bidding up the asset values of resource stocks.

These insights are valuable in explaining how market economies have dealt effectively with resource constraints. But most contemporary economists acknowledge that there are limits to their applicability. Prices can guide market adjustment processes only if resources can be bought and sold, which presupposes that they can be owned. Many important resources are not privately owned, usually because it is impossible to segregate one person's portion from another's and reserve it for exclusive use. Chief Seattle of the Dwamish and Squamish Indians of Puget Sound replied to U. S. President Franklin Pierce in 1855 when the government wanted to buy his tribe's land: "The idea is strange to us. If we do not own the freshness of the air and the sparkle of the waters, how can you buy them?" The air, the waters, the wealth of wild species, and still, in parts of the world, the grazing lands and forests belong to everyone.

Unless the community collectively exercises control over the use of such "common property" resources, through legal and regulatory restraints in modern states and through custom or the decisions of the leaders in traditional societies, scarcity feeds on itself. Users assume that if they take less of the depleted resource, others will just take more; if they find ways to increase its availability, others will garner the fruits of their efforts. Or, if the resource is vast like the atmosphere, their small sacrifices to preserve it would have insignificant effects. Even if market processes could be relied on to deal effectively with privately owned resources, the importance of common property resources in our basic life-support systems gives grounds for concern about future scarcities in the face of increasing demands on them.

But market processes are also shortsighted about future private demands. A businessman who holds resources off the market for future sale ties up capital that could be profitably invested elsewhere, and expects an equivalent rate of return. Even if returns on alternative investment are no more than 7 percent per year, a businessman could only justify conserving a resource for 100 years if its value were expected to rise more than 800 times over that period.

Natural science views

Natural scientists see other limitations to neoclassical economic analysis of population and resources. Economic models are basically empirical approximations, and if extrapolated far beyond the range of known experience, they can be misleading—not least because they can conflict with the physical laws of nature. For example, typical "long-term" economic growth models imply that with the population growing at a constant rate, output will also settle down to an equilibrium rate of growth determined by the rates of technological advance and labor force increase.

This conflicts with scientists' knowledge of equilibrium in finite natural systems. If world population were to grow continuously at the 1987 rate of 1.67 percent per year, then the earth's land area, excluding Antarctica, would be packed solid with 427,383.8 billion people by the year 2667—85,477 times the 5 billion of 1987. Although Antarctica is chilly, in a pinch it could provide additional standing room—for seven more years. The year 2674—687 years into the future—may seem remote, but if we look back the same number of years into the past, we find Marco Polo returned to Venice from his journeys in China, the great cathedrals of Notre Dame and Chartres already dedicated, and the era of modern warfare opening in Europe with gunpowder introduced from the East.

Continuing exponential growth of output is, of course, equally impossible. Automobiles, increasing more rapidly than the human population, would exhaust all available space much sooner, starting from certain cities where they already have done so.

Scientists also see limits to substitution possibilities. To an extent, labor and capital inputs can substitute for materials in the manufacturing process, but no amount of additional kneading and baking will produce a loaf of bread from an ever-decreasing amount of wheat. More fundamentally, energy is essential to all life-sustaining processes, and all such processes dissipate useful energy. Substituting for the decreased richness or accessibility of mineral ores generally requires more energy per unit of output. Substituting for the decreased availability of agricultural land by raising yields per hectare generally requires more energy per unit of output, in the form of labor, chemical, and machinery inputs. While energy can be used more efficiently in these processes and also in the conversion of energy sources to useful forms, nothing could be substituted for increasingly scarce energy if low-cost, concentrated sources were depleted.

Biologists sometimes apply the concept of carrying capacity to questions of human population pressure. In population biology, carrying capacity is the maximum population of a species that its habitat can sustain. In density-dependent species, like fruit flies in a bottle, it is the limit to which the population will grow. Efforts have been made to estimate the size of human populations relative to land's carrying capacity. At the global level, estimates range from a maximum carrying capacity of 7.5 billion to over 40 billion people.[8]

A recent large-scale study by the Food and Agriculture Organization (FAO) estimated potential agricultural production in 117 developing countries on the basis of climate, soil and land-use maps, and three alternative levels of technology.[9] The results were compared with the food requirements of projected populations in 1975 and 2000. In all these countries together, potential agricultural output was estimated to be four times the population in 2000 at an intermediate level of technology (the use of basic fertilizers and chemicals, some improved seed varieties, and simple conservation methods). However, the study estimated that 36 countries, mostly in Africa, Asia, and Central America, would be "critical" in the sense that their populations in 2000, totaling 480 million people, would exceed potential food production with intermediate technology.

Such an application of the carrying capacity concept is misleading. Many "critical" countries that lack agricultural resources, such as Kuwait and Korea, can readily trade for food with nonagricultural exports. By adopting smaller geographical units and ignoring trading opportunities, the number of "critical" regions can be made to increase markedly.

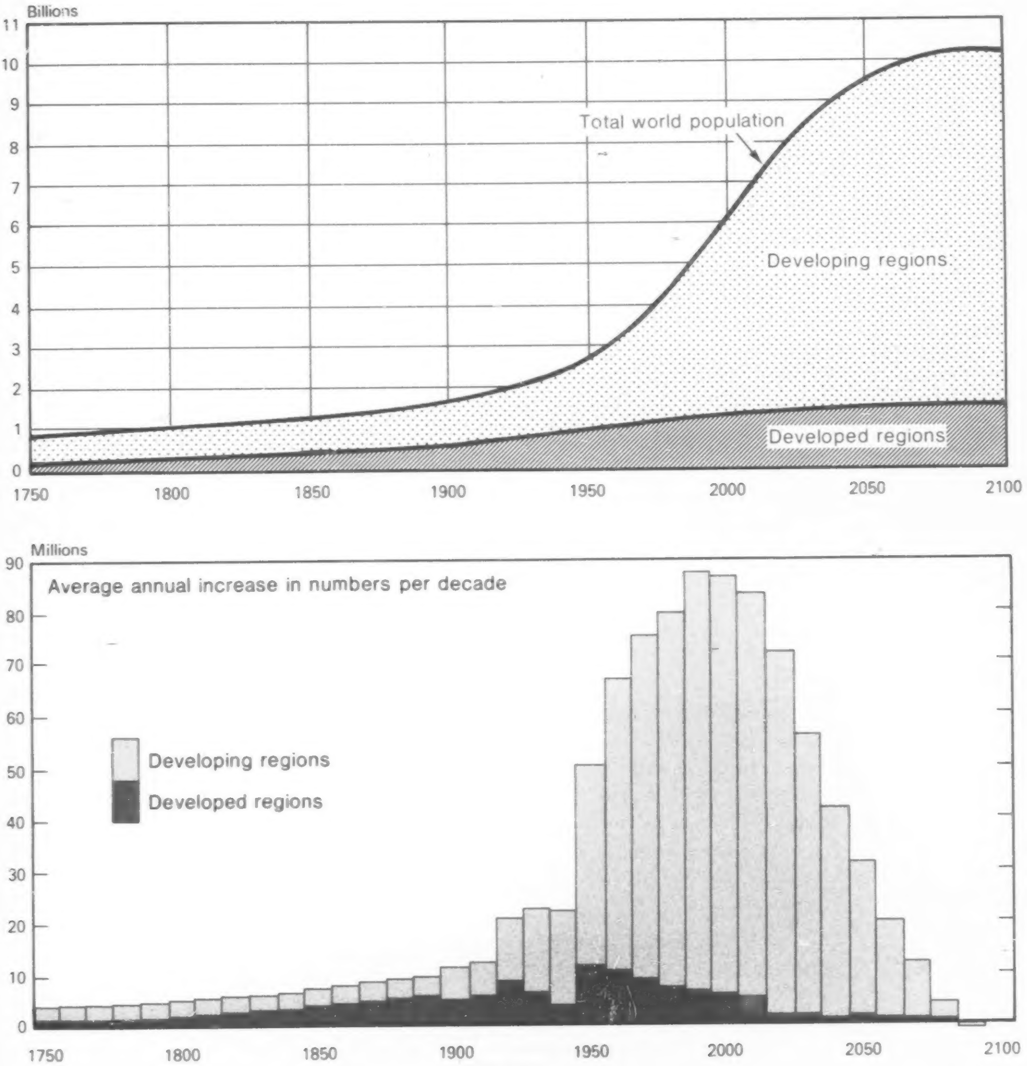
Furthermore, the implicit analogy to nonhuman species, which don't approach man's capacity for modifying both his environment and his way of using it, is faulty. From the beginning, humans have adapted to population pressures. Hunting societies used fire to drive game and reduce cover, altering the landscape in the process. When prized large mammals became scarcer, these people broadened their diet to include more plentiful food sources.[10] Technological and cultural responses to population growth have been accelerating ever since. Agriculture developed, largely in response to population density, from shifting cultivation with long fallow periods, to short fallow and cropping rotations dependent on organic manuring, to intensive monocultures using high-yielding seed varieties, irrigation, chemicals, and energy inputs.[11]

Moreover, social mechanisms that regulate population growth are found in both traditional and modern societies. Outmigration has always been a response to population pressure. Prolonged breastfeeding and sexual taboos restricted births in hunting societies to well under half the biological potential. Fertility in preindustrial Western Europe was restrained by inheritance laws that delayed marriage. Contemporary societies also resort to contraception and abortion. In societies subject to high mortality rates, mechanisms have evolved to keep fertility high, such as early and universal marriage. Unlike other species, humanity controls to a high degree its own demography and its resource base.

Such adaptations by no means ensure against stress, including environmental damage and poverty. Natural scientists also point out broader stresses against natural resource limits. Human expansion impinges on ecosystems functioning on both local and global scales. A large and increasing share of the biosphere's net primary production has been appropriated for human use.[12] Net primary production is the increment in biomass created by fixing solar energy through photosynthetic conversion of carbon dioxide into usable carbon compounds. Diverting more for human use leaves less for maintenance of the rest of the biosphere. Among the consequences of this increasing appropriation are destruction of habitat for other species, leading to simplified and impoverished ecosystems and accelerated rates of extinction.[13]

Examples of disturbed natural systems are widespread. Worldwide, the burning of fossil fuels for energy and other processes leading to large emissions of "greenhouse gases" have disrupted the carbon cycle and global heat balance, setting off a process of substantial climate modification and warming. Scientists emphasize that they cannot predict with any certainty what will happen as such critical natural systems are dis-

Figure 1. World, Developing and Developed Regions, Population Growth: 1750-2100



Source: Thomas W. Merrick, with PRB staff, "World Population in Transition," *Population Bulletin*, Vol. 41, No. 2 (April 1986) Figure 1, p. 4.

turbed and that by the time the consequences are evident, the changes may be irreversible. The ecological limits being tested are not protected by rising prices, since the threatened resources—biological diversity, climate, and communal woodlands—are mainly in the public domain.

The Population Prospect

Although the debate about population growth and resources is long-standing, recent demographic developments are unprecedented. When Malthus wrote at the start of the 19th century, world population was growing slowly in absolute and relative terms. World population was about 1 billion, and it took 130 years to add another billion. The third billion was added in 30 years, by 1960, the fourth billion was reached by 1974, 14 years later, and the fifth in 1987, 13 years later. As Figure 1 (page 9) illustrates, the scale of current population growth is unlike anything seen before. More than 85 million people, the equivalent of a new Mexico, are added to the world's population each year.

Also unique is the shift in population growth to the less developed countries. Until the 1930s, population grew more rapidly in the richer countries. High mortality checked growth in poorer countries, but since World War II, antibiotics, vaccines, insecticides, and improved sanitation and nutrition have markedly reduced their death rates. Birth rates have fallen much more slowly, as marriage ages have gradually risen and contraceptive use has spread. Since 1950, 85 percent of the total population increase has been in the Third World.

Dramatic as these changes are, they are overshadowed by the downturn in the world population growth rate in the early 1970s. Annual growth touched 2 percent in the late 1960s, implying that population would double in less than 35 years, but the rate then fell back. Thus, a progression of ever-shortening doubling times that began in prehistoric times has finally been reversed. This change does not relieve the pressures of rapid growth: *absolute* annual increments are projected to rise to a peak of about 90 million in the late 1990s. But we now see the passing flood crest of population growth.

As of 1987, the world's demographic future holds another doubling of population and increasing divergence between developing countries other than China and the industrialized world. Current United Nations medium projections assuming fairly rapid declines in birth and death rates in developing countries foresee population ultimately stabilizing toward the end of the next century at about 10.2 billion. They project that only 256 million more people will be added in the developed countries between 1985 and 2000, while over 5 billion additional people will inhabit the rest of the world by the end of the 21st century (see Table 1).

Fertility in the developed world has already fallen below the replacement level of 2.1 births per woman and only the momentum of an unbalanced age distribution and immigration keep population growing. China, home to over a fifth of the world's people, has nearly reached a similar position after a precipitous decline in fertility (and also in mortality).

Other developing countries show much greater differences. Africa, the Moslem Middle East, and Western Asia still have birth rates higher than recorded anywhere else in the world *before* the onset of demographic transition (except in the United States) and population growth rates have been rising as mortality declines. Latin America and the rest of Asia are in demographic transition from high to low birth and death rates, but at speeds that vary considerably from country to country. In many of the countries that have only recently entered the demographic transition, such as Mexico, Thailand, and Indonesia, birth rates have dropped by more than one point per 1,000 population per year during some five-year periods since the 1960s, which is two to four times faster than earlier declines in Europe and the United States. In other developing countries, such as Bolivia, Guatemala, and Bangladesh, birth rates have declined little.

Long-run projections for the developing countries are uncertain. Overall birth rates are still high and the gap between birth and death rates is generally still large. Many trajectories of decline in population growth are plausible. Nearly 40 percent of developing country people are less than 15 years old and their fertility as adults will make an enormous difference. The medium UN projection cited above assumes that world fertility will be

Table 1. World, Developing and Developed Regions, Projected Population Growth: 1985-2100

(Numbers in millions)

Region	1985	2000	2025	2100
World total	4,837	6,122	8,206	10,185
Developing regions	3,657	4,837	6,779	8,748
Africa	555	872	1,617	2,591
Asia (minus Japan)	2,697	3,419	4,403	4,919
Latin America	405	546	779	1,238
Developed regions	1,181	1,284	1,407	1,437
Europe, USSR, Japan, Oceania[a]	917	987	1,062	1,055
North America[b]	264	297	345	382

Source: Merrick, "World Population in Transition," Table 1, p. 12.

[a] Oceania includes Australia and New Zealand.

[b] North America = Canada and the United States.

at replacement level by 2035; just a 30-year delay would mean an ultimate population size 4 billion larger.[14]

According to projections to 2025, 85 percent of the population increase in the Third World will be in urban areas: the urban population will grow by more than 3 percent per year. Large cities will grow even faster. In 1985 there were 28 Third World cities with more than 4 million inhabitants, home to 222 million people. By 2000 there will be 50 such agglomerations, with a total population of 455 million.[15] This expansion will put enormous pressure on urban environments. Yet, rural populations will also expand until well into the next century, in total by at least a half billion people.

Consequences of Population Expansion

Living standards

The demographic flood now cresting has not been contained by the "positive checks" that Malthus feared: famine, war, and pestilence. Rather, it has been the "preventive checks" of later marriage and falling fertility within marriage that have reduced growth rates, even as mortality has continued to decline. Modernization and rising living standards have checked population growth, not poverty and resource limits.

Although rapid population growth has strained the capacities of developing economies to provide employment, to raise agricultural output, and to make the investments necessary for expanding cities to function, living standards have risen in almost all countries. As Table 2 shows (page 12), over the period of maximum growth rates (1960-1984), per capita income and agricultural production, school enrollment and literacy, life expectancy and other measures of welfare, all improved. Population increase may have enormously complicated the task of development, but clearly has not precluded some degree of success.

Such improvements are cited as evidence that population growth does not impede economic progress, but the question remains whether progress would have been faster had population increase been slower. This question cannot be answered with certainty, but the balance of expert opinion says yes.[16] Output per person would probably have increased faster, because more capital per worker would have been accumulated and expenditures per person on

Table 2. Socioeconomic Indicators, Selected Countries: About 1960 and 1984

Country	Population (millions) mid-1984	Average annual growth of GNP per capita (percent) 1965-84	Average index of food production per capita (1965-67 = 100) 1982-84	Life expectancy at birth (years)	
				1960	1984
Low-income	2,389.5	2.8	111.4	36	60
China	1,029.2	4.5	138.2	51	69
India	749.2	1.6	117.7	42	56
Kenya	19.6	2.1	72.2	43	54
Middle-income	1,187.6	3.0	108.2	49	61
Brazil	132.6	4.6	131.1	56	64
Egypt	45.9	4.3	94.6	45	60
Indonesia	158.9	4.9	140.4	40	55
Mexico	76.8	2.9	101.9	56	66
Nigeria	96.5	2.8	85.4	34	50
Industrial market	733.4	2.4	117.9	70	76
Japan	120.0	4.7	97.4	67	77
United States	237.0	1.7	119.7	70	76
East European nonmarket	389.3	—	117.4	66	68
USSR	275.0	—	114.1	68	67

Sources: World Bank, *World Development Report 1978* and *World Development Report 1986* (New York: Oxford University Press, 1978, 1986); UNESCO, *1985 UNESCO Statistical Digest* (Paris: 1985).

education and health would have been greater. However, expert opinion today emphasizes that other factors, such as economic policies and political institutions, influence rates of economic progress at least as much as variations in population growth rates do.

Poverty and inequalities

Improved living conditions for the "average" person also divert attention from the growing numbers whose living standards are below stringent poverty levels. The World Bank has estimated that in 1978, 780 million people outside China and the centrally planned economies lived in absolute poverty, barely able to survive.[17] Despite reductions over time in the proportion of the world population suffering such deprivation, population growth has pushed the numbers upward. By 1987 the world total of such deprived people probably exceeds one billion. It is important to recognize that widespread chronic malnutrition and famines in the Third World are typically not due to global, regional, or even national food shortages, but rather to poor households' inability to purchase the food that is potentially available.

The difference between average living conditions and those of the poor is affected by rapid population increase, partly because, except for those in worst need, poor households tend to have more children to support than those who are well off. Also, by depressing wages relative to rents and returns to capital, rapid population growth devalues what poor households have to sell—their labor. Property owners gain relative to wage earners when the labor force grows quickly. However, politics and economic policies influence the distribution of income within countries far more than population growth rates do.

Poverty adds considerably to resource pressures in the Third World. Poor households are often virtually forced to overuse natural resources for daily subsistence. Thus, landless farmers colonize tropical forests, or grow cassava

Infant mortality rate (under age one)		Number enrolled in school as percent of age group				Adult literacy rate (percent)	
		Primary		Secondary			
1960	1984	1960	1983	1960	1983	1960	1985
142	72	30	91	2	31	10	—
51	36	—	104	—	35	—	69.3
139	90	41	85	23	34	24	43.5
—	92	47	100	30	19	—	59.2
142	72	79	105	12	47	61	—
70	68	95	102	11	42	61	77.7
109	94	66	88	16	58	20	44.5
82	97	67	115	6	37	47	74.1
74	51	80	119	11	55	62	90.3
207	110	36	98	3	—	25	42.4
25	9	108	102	53	85	—	—
31	6	103	100	74	94	98	99.9
26	11	118	100	64	—	98	99.5
—	19	—	104	—	91	—	—
—	—	100	106	73	99	98	99.8

and maize on highly erodible hillsides. Rural households in fuelwood-deficit countries strip foliage and burn crop and animal residues for fuel rather than using them for fertilizer and this contributes to desertification. Underemployed men in coastal villages overexploit already depleted inshore fisheries. A cycle of poverty and natural resource degradation is established.

Table 3 (page 14) presents 1980 data on the concentration of landholdings in developing countries, one important indicator of poverty and inequality. In Brazil, for example, a small fraction of landholders (16 percent) commands a large share of agricultural land (87 percent), and this pattern is typical. Actual inequality is substantially greater than such data indicate, because many smallholders only sharecrop or lease their holdings and a substantial percentage of rural households have no land at all. Much of the expansion of agricultural area in recent decades has not been added to small subsistence holdings but rather to large estates.[18] In countries such as Brazil and Guatamala, unequal distribution rather than overall land shortage creates the most severe pressures on marginal areas.

Population growth has also helped to widen disparities in income among nations. In the past 20 years, low-income countries as a group have actually raised total output, measured by gross national product (GNP), more rapidly than rich countries, but most of these gains have been offset by higher population growth rates. In per capita terms, the relative gap has narrowed negligibly while the absolute gap has widened substantially. Compare India and the United States over the period 1965 to 1984. Total GNP grew faster in India, but because population also grew twice as fast, India's average annual per capita income growth, 1.6 percent, was virtually the same as that of the U. S., 1.7 percent (see Table 2). In constant prices, per capita incomes were $190 and $10,985 in the two countries in 1965. By 1984, per

Table 3. Distribution of Agricultural Holdings and Area, by Size of Holdings, Selected Countries: 1980

	Size of holdings					
	Under 5 hectares		5-50 hectares		Over 50 hectares	
Country	Percent of holdings	Percent of area	Percent of holdings	Percent of area	Percent of holdings	Percent of area
Brazil	37	1	45	12	16	87
Guatemala	78	11	19	25	3	64
India	91	51	9	46	0	3
Nepal	97	71	3	29	0	0
Niger	58	33	42	67	0	0
Pakistan	73	34	26	57	0	9
Panama	66	4	27	30	7	66
Philippines	86	51	14	37	0	12
Thailand	72	39	28	61	0	0
Turkey	62	20	37	68	1	11
Uruguay	12	0	46	4	42	96

Source: International Institute for Environment and Development (IIED) and World Resources Institute (WRI), *World Resources 1987* (New York: Basic Books, 1987) Table 19.2, p. 278.

capita income had grown by only $70 in India, in contrast to a $4,400 increase in the U. S.

These disparities have fundamental implications for resource use. In the United States and other rich countries, because the average diet contains so much meat, each person consumes (directly and indirectly) enough grain to feed four Indians, and aggregate cereal consumption is a large fraction of the world total. The same holds true for commercial fuels, metals, wood, and paper and other resource-based commodities. As Table 4 demonstrates, the developed countries use most of the world's resources, despite their much smaller share of total population (17 percent in 1984) and lower population growth rates.

Many of the demands on natural resources in the developing countries thus emanate from the developed world. The developing countries are substantial net exporters of agricultural commodities, although they have become net importers of foodgrains. Similarly, huge volumes of tropical hardwoods and other forest products, beef cattle, minerals, and petroleum products flow to meet the demands of industrial countries, in exchange for processed manufactures. Much of the capital and technology for the exploitation of developing countries' natural resources also emanates from the industrial world. Resource pressures in the developing countries should by no means be attributed solely to high rates of population growth.

Effects on renewable resources

Economic and demographic expansion has transformed the resource base. This base consists of both "nonrenewable" or seemingly exhaustible resources like fossil fuels, metals, and nonmetallic minerals (dealt with in the next section) and renewable resources: land, water, and the nonhuman species like trees, plants, animals, fish, birds, and insects who share these ecosystems with humans and on whom humans in turn depend. Perhaps most transformed of renewable resources has been the land.

Effects of increasing cropland. Up until World War II, increasing agricultural demands fueled by population and economic growth were met mainly by expanding the area under cultivation. Table 5 (page 16) shows that 963 million hectares, or almost two-thirds of the 1.5 billion hectares farmed as cropland by 1980, was brought into production after

Table 4. Consumption of Major Resource Commodities, by Region: 1984

Population and resource	Developing countries	Developed countries	USSR and Eastern Europe
Population (millions)	3,592	792	388
Percent of total	75.3	16.6	8.1
Commercial fuels (metric tons of coal equivalent, thousands)	1,953,187	4,603,777	2,241,617
Percent of total	22.2	52.3	25.5
Per capita (kilograms)	543.8	5,816.0	5,777.4
Steel (metric tons, thousands)	200,656	313,799	193,87
Percent of total	28.6	44.3	27.4
Per capita (kilograms)	55.9	396.2	499.7
Cereals (Production) (metric tons, thousands)	929,000	595,704	276,980
Percent of total	51.6	33.1	15.4
Per capita (kilograms)	250.3	752.2	713.9
Wood (cubic meters, thousands)	91,400	363,000	178,600
Percent of total	14.4	57.3	28.2
Per capita (kilograms)	24.6	458.3	460.3

Source: United Nations, 1983/84 *Statistical Yearbook* (New York: 1986).

1850, and most of it—1.2 billion hectares—by 1950. The table also shows that this expansion, especially from 1850 to 1950, was by no means limited to the "New World." Vast areas were cleared and put to the plow in the USSR, in South Asia, and in Africa, as well as in the New World of North and Latin America. Pioneers were at work clearing forests in southern Burma, battling malaria in the shadow of the Himalayas, and pushing cultivation northward into Sahelian pastoral ranges in Africa. Were comparable data available for the century before 1850, they would show an equally dramatic increase in the area under cultivation. By 1980 global cropland had increased 179 percent over the figure for 1850.

The counterpart has been a substantial reduction in the extent of other ecosystems—temperate and tropical forests, grasslands, and wetlands (see box on India, page 18). Almost a billion hectares of forests and woodlands have been cleared since 1850, about half the total reduction in forest area since prehistoric times. Cumulatively, a greater percentage of the original temperate forests have been removed than those covering the tropics, but since World War II—the period of massive population increase in the developing countries—the locus of deforestation has shifted. Temperate forest area is stable, but deforestation in the tropics has accelerated. In the 1980s, according to FAO estimates, more than 11 million hectares—the area of Pennsylvania—have been deforested each year in the tropics.[19] This represents an annual rate of only 0.6 percent of the total tropical forest area, because in large countries such as Brazil, Indonesia, and Zaire, enormous forests remain, even though deforestation in those three countries alone totals over 2 million hectares each year. In other countries, the conversion rate is much higher. Cote d'Ivoire, which at 3.0 percent in 1987 has one of the world's highest rates of natural increase (birth minus death rates), is losing forests at the rate of 5.9 percent annually. Deforestation is also rapid in Costa Rica (3.9 percent a year), Haiti (3.1 percent), El Salvador (2.9 percent), and Nicaragua (2.7 percent), where natural increase rates range upward from 2.3 percent a year.

Table 5. World Land Use, by Region: 1850-1980

Region and land type	Area (million hectares)				Percent change 1850-1980
	1850	1900	1950	1980	
Ten regions, total					
Forests and woodlands	5,919	5,749	5,345	5,007	−15
Grassland and pasture	6,350	6,284	6,293	6,299	−1
Cropland	538	773	1,169	1,501	179
Tropical Africa					
Forests and woodlands	1,336	1,306	1,188	1,074	−20
Grassland and pasture	1,061	1,075	1,130	1,158	9
Cropland	57	73	136	222	288
North Africa and Middle East					
Forests and woodlands	34	30	18	14	−60
Grassland and pasture	1,119	1,115	1,097	1,060	−5
Cropland	27	37	66	107	294
North America					
Forests and woodlands	971	954	939	942	−3
Grassland and pasture	571	504	446	447	−22
Cropland	50	133	206	203	309
Latin America					
Forests and woodlands	1,420	1,394	1,273	1,151	−19
Grassland and pasture	621	634	700	767	23
Cropland	18	33	87	142	677
China					
Forests and woodlands	96	84	69	58	−39
Grassland and pasture	799	797	793	778	−3
Cropland	75	89	108	134	79
South Asia					
Forests and woodlands	317	299	251	180	−43
Grassland and pasture	189	189	190	187	−1
Cropland	71	89	136	210	196
Southeast Asia					
Forests and woodlands	252	249	242	235	−7
Grassland and pasture	123	118	105	92	−25
Cropland	7	15	35	55	670
Europe					
Forests and woodlands	160	156	154	167	4
Grassland and pasture	150	142	136	138	8
Cropland	132	145	152	137	−4
USSR					
Forests and woodlands	1,067	1,014	952	941	−12
Grassland and pasture	1,078	1,078	1,070	1,065	−1
Cropland	94	147	216	233	147
Pacific developed countries					
Forests and woodlands	267	263	258	246	−8
Grassland and pasture	638	634	625	608	−5
Cropland	6	14	28	58	841

Source: IIED and WRI, *World Resources 1987*, Table 18.3, p. 272.

Such estimated changes in forest area can be misleading, because they conceal changes in the density of tree cover and the species composition. In general, as long as trees cover 10 to 20 percent, an area is considered forested, even though the density may have been reduced from several hundred to fewer than 50 trees per hectare and the mix of species altered significantly. In logged-over tropical moist forests, removing high-grade species has devalued remaining stands.

In semi-arid areas, tree density has fallen as the result of foraging and fuelwood collection.

The open savannahs of the Sahel are rapidly being stripped of their remaining trees; annual fuelwood consumption alone exceeds annual tree growth by an estimated 30 percent. In Niger, this figure is 200 percent; in northern Nigeria, 75 percent; in Ethiopia, 150 percent; and in the Sudan, 70 percent.[20] Worldwide, the FAO estimates that 1.5 billion of the 2 billion people who rely mostly on fuelwood are cutting wood faster than it is growing back, and 125 million in 23 countries even then cannot find enough wood to meet their needs.[21]

In the humid tropics, forest conversion has imperiled the principal source of the world's biological diversity: millions of plant, animal, and insect species whose potential value to agriculture, medicine, and science has yet to be explored. The total extinction rate cannot be reliably estimated, because scientists, who so far have classified 1.5 million species, do not even know whether another 1.5, 15, or 30 million species remain to be classified. Yet, the situation in critical ecosystems illustrates the larger problem.

In Madagascar, there were until recently 9,500 documented plant species and an estimated 190,000 animal species, 60 percent of them found only in or "endemic" to the island's eastern forest strip. Ninety-three percent of that forest has already disappeared, dooming at least 60,000 species.

In just 10,000 square kilometers of South Africa's Cape Floristic Kingdom, there are 6,000 known plant species, 70 percent of them endemic to that area. Encroaching farms, frequent fires, and invasions by exotic plants threaten at least 2,000 plant species (almost as many as exist in the entire United States).

The forests of western Ecuador are reputed to have once contained somewhere between 8,000 and 10,000 plant species, with 40 to 60 percent endemic. Estimates based on detailed inventories from sample plots suggest that there are 10 to 30 animal species for each plant species, implying a total species resource of about 200,000. Since 1960 virtually the entire forest cover of western Ecuador has been eliminated to make way for banana plantations and other land uses. Tens of thousands of species must have been eliminated.

Not all of the many exceptionally rich and endangered ecosystems are in the tropical forests. In Central Africa, for example, the 29,000-kilometer-square Lake Malawi contains more than 500 cichlid fish species (which include the tilapia species valuable for aquaculture), 99 percent of them endemic. This lake is one-tenth the size of the Great Lakes of North America, which contain only 173 species, only 10 percent of them endemic. Lake Malawi's fish are threatened by industrial pollution and the introduction of alien predator species.

Vast areas of wetlands have been drained in the last 150 years for farming, an estimated 50 million hectares in the United States alone, 20 million hectares in Europe and European Russia, plus tens of millions of acres in Asia.[22] In total, between 25 to 50 percent of the world's wetlands have been lost to date.[23] Wetlands are among the world's most productive ecosystems, along with tropical rain forests and coral reefs. Because their net primary productivity is so high, they provide habitat and breeding grounds for a disproportionate share of fish, crustaceans, amphibians, birds, and small mammals.

While the area under grasslands and pasturage seems more stable (see Table 5), the figures mask far-reaching changes. Millions of hectares of herders' best pasturage have been plowed up for cropland. At the same time, controlled grazing of domestic livestock has displaced herds of wild herbivores. Just as the bison, elk, and antelope have disappeared from the American plains, the enormous indigenous herds of browsing animals that amazed 19th century European explorers of Africa have dwindled to

Box 1. Long-Term Agricultural and Land-Use Trends in India

India, where there are data going back nearly a century, illustrates the interplay between population growth, agricultural production, and land use. In this century, the Indian population has more than tripled, from 240 million in 1900 to 800 million in 1987, an average growth rate of 1.38 percent per year. The agricultural response has been equally dramatic.

In the first half of the century, there was a massive expansion of cropland. Data for 183 districts in the northern Indian subcontinent, including parts of present-day Bangladesh and Pakistan, show that the arable area expanded by more than 25 million hectares or 45 percent between 1890 and 1970.[1] Other terrestial ecosystems—forests, woods, grassland, and scrub—were reduced by 30 to 40 percent (see table).

At the same time because of population growth, however, the land resource base diminished sharply in per capita terms. The availability of arable land declined from 0.39 to 0.23 hectares per capita and that of forests, woods, grasslands, and scrub shrank even more—from 0.49 to 0.13 hectares per capita.

Land Use in 183 Districts of Northern India: 1890-1970

(Numbers in millions of hectares)

Land type	1890	1950	1970
Total area	155.6	155.6	155.6
Percent of total	100.0	100.0	100.0
Arable	59.1	73.1	86.1
Percent of total	38.0	47.0	55.3
Settled	2.8	4.2	6.6
Percent of total	1.8	2.7	4.2
Forest and woods	13.6	10.2	9.2
Percent of total	8.7	6.5	5.9
Interrupted woods	19.8	15.6	12.2
Percent of total	12.7	10.1	7.8
Grassland	22.3	18.5	14.2
Percent of total	14.3	11.9	9.1
Wetlands	4.9	3.6	3.2
Percent of total	3.1	2.3	2.1
Scrub and wasteland	28.7	25.8	19.6
Percent of total	18.5	16.6	12.6
Surface water	4.5	4.5	4.5
Percent of total	2.9	2.9	2.9

Source: See reference 1.

Offsetting the growing scarcity of arable land was a substantial intensification of land use. Irrigated acreage expanded almost ninefold, from 2.6 million hectares in 1890 (4.4 percent of the arable area) to 22.3 million hectares in 1970 (26 percent of the arable area). The colonial government invested significantly in irrigation before independence in 1947, but the irrigated area doubled after 1950, in large part from private investments in tubewells.

Cropping intensity rose sharply on this irrigated acreage. The area left fallow fell from 17 to 10 percent between 1930 and 1970. The use of chemical fertilizers, largely in conjunction with high-yielding seed varieties, grew from a negligible amount to 8.6 million tons of nutrient used overall in India in 1985—160 kilograms per hectare of irrigated area.[2] After 1950 there was no further expansion of gross cropped area, but production rose due to significant improvements in crop yields.

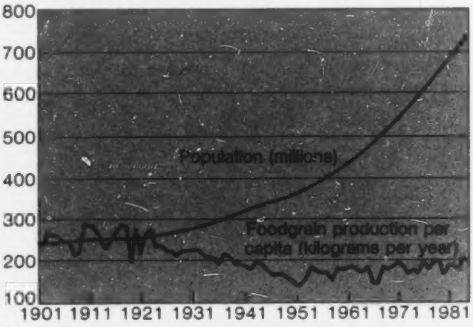
The figure illustrates one result of this process. Independent India has succeeded in raising foodgrain production per capita by a modest amount since 1951. Its agricultural growth rate, while not exemplary, has equaled that of developing countries as a whole. Yet current per capita output remains well below the averages that prevailed in India in the early decades of this century.

Another result is increased pressure on the remaining nonarable land. Livestock, fed overwhelmingly on crop residues and natural forage rather than on fodder crops, increased in numbers proportionately with the expansion of cropped area. However, the

remnants mostly confined to parks and preserves.

Even with "controlled" grazing, the world's grasslands have markedly deteriorated under growing grazing pressures. Most rangelands are relatively susceptible to degradation, especially those in dry climates where plant growth is slow. Impoverishment and depletion of vegetative cover as the result of over-

Population and Per Capita Foodgrain Production in India: 1901-1985.



Source: See reference 2.

ratio of livestock to people fell from 98:100 to 59:100 between 1900 and 1972 as pasturage provided by woods, grassland, and wastelands disappeared.

The transformation of these resources to cropland has affected the rural poor disproportionately, because for the most part it was a transformation from common property on which poor households depended to private property from which they were largely excluded. A study in seven Indian states, reported in 1986, found that poor households graze their animals on the commons from 70 to 90 percent of the time, compared to 20 to 40 percent for better-off rural households. Poor households obtain 60 to 90 percent of their fuel from the common lands, compared to 10 to 20 percent for other households. The rural poor also rely much more heavily on common land for gathering food, raw materials for handcrafts, and other subsistence.[3] The loss of natural ecosystems decreased living standards most for poor households with least control over the expanding cultivated area.

In the study areas of the seven states, 26 to 63 percent of common woods, grassland, wetlands, and wasteland had disappeared in the previous three decades, mostly through conversion to private cropland. Although some conversion programs were designed to alleviate rural poverty, most of the converted land ended up in the hands of better-off households. For India's rural poor a valuable and accessible resource disappeared, and thus the transformation has had less favorable long-term implications than suggested by trends in per capita foodgrain production.

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Farming in Rajasthan, India. Cropland expansion has sharply reduced woods, grassland, and other common land on which India's poor rural households depend.

stocking expose the soil surface to wind and water erosion, deplete the soil's organic content and nutrients, and impair its ability to hold water, a process known as desertification. As used in recent assessments, "moderate" and "severe" desertification generally involve productivity losses of up to 25 and 50 percent, respectively. More than 60 percent of the world's rangelands and at least 80 per-

Kenyan herders and their cattle. With growing grazing pressures, more than 60 percent of the world's rangelands are now moderately to severely desertified.

cent of African, Asian, and Middle Eastern rangelands are now assessed as moderately to severely desertified. About 65 million hectares of once productive land in Africa have become desert during the past 50 years.

As cultivation has extended from the plains and valleys into the once forested hills, an estimated 160 million hectares of upland watersheds in the tropical developing countries have been seriously degraded. Watersheds are seriously deteriorating in the foothills of the Andes and the Himalayas, in the Central American highlands, in the Central Highlands of Ethiopia, on densely populated Java, and elsewhere. Estimated rates of erosion for entire upland regions typically range from 30 to 60 tons per hectare per year. A recent World Bank study chose an average figure around 50.[24] In smaller, severely eroding watersheds, measured rates exceed 100 tons per hectare per year.

The effects are serious. Numerous studies show that yields decline at an increasing rate as fertile topsoil is lost. Eroded sediments are typically at least twice as rich in nutrients and organic matter as the soils left behind. Thin, nutrient-poor soils widely distributed in tropical and semi-arid areas are much more susceptible to productivity loss through erosion than temperate soils. In Indonesia, at least a million hectares have been rendered unproductive through erosion and 200,000 more hectares are being lost each year.[25] In Guatemala, 40 percent of the productive capacity of the land has been lost through erosion. In Turkey, 54 percent of the arable area is severely or very severely affected. In Mexico, roughly two-thirds of the land is moderately, severely, or totally eroded.[26] The FAO has estimated for all developing countries that, unless effectively checked, erosion will cost 20 percent of potential agricultural production by the end of this century.[27]

Off-site economic costs are also large. Reservoirs in the developing world are filling up with silt much faster than anticipated when the investments were made—typically, two or three times faster in South Asia—cutting short their usefulness for power generation and irrigation water storage when replacement costs are rising rapidly. Pakistan's Mangla Reservoir is an example. Built during the 1960s with a 100-year life expectancy, it may fill up with silt as much as 50 years ahead of its time. The giant Tarbela Dam, built during the late 1960s and early 1970s, will be useless within just 40 years at current rates of siltation. In India, the expected lifespan of the Tehri Dam, the world's sixth largest when finished, has already been reduced from 100 to 40 years due to deforestation of the watershed. These are merely indicative of downstream costs. Abraded turbines, increased water treatment costs, reduced fish populations, and changed river flows add to the damages of heavy sediment loads. Upstream devegetation also increases flooding after the rainy season and reduces dry season flows.

Effects of efforts to increase yields. Until 30 years ago, bringing new lands under cultivation was the principal means

Table 6. World Increases in Crop Area and Yields, by Region: 1964-1985

Region	Percent change in cropland 1964-66 to 1982-84	Percent change in yields 1964-66 to 1983-85	
		Cereals	Roots and tubers
World	8.9	58	21
Africa	13.5	13	22
Asia	4.1	77	58
North and Central America	7.8	44	23
South America	34.6	42	−1
Europe	10.5	76	19
USSR	1.3	35	13
Oceania	23.5	25	13

Source: IIED and WRI, *World Resources 1987*, Table 18.1 and 19.1, pp. 268 and 276.

of raising agricultural production. In most countries, yields increased gradually, if at all. Just since the early 1960s, the situation has reversed; cropland area has grown slowly in most countries, and the additional output has come mostly from increasing yields. Table 6 illustrates this phenomenon for the principal regions of the world. The reversal stemmed partly from increasing constraints on the availability of additional cropland in densely populated areas, such as China and South Asia, where cropped area is less than one-fifth of a hectare per person. It also stemmed from new opportunities: development of improved, high-yielding seed varieties, falling real prices for chemical fertilizers, and the availability of new synthetic pesticides. When combined on areas with assured water supplies, mostly through irrigation, this new technological package generated the "Green Revolution." This was a remarkable and critical achievement that supplied needed food and agricultural products at stable and declining real prices during a period of rapid population and economic growth. However, it also created pressures on the resource base.

The new technology and rising food demands encouraged large irrigation investments. Between 1965 and 1980, the total world acreage under irrigation increased 2.2 percent per year, reaching 15 percent of all cropland. Because inputs and the new technology were concentrated on irrigated land, it contributed most of the increased production. The costs of irrigating additional acreage have risen, while yields on large tracts of already irrigated land are declining due to salinization and waterlogging.

High water tables markedly concentrate salts in the root zones. In many irrigated areas without adequate drainage, in India and Pakistan for example, water tables have risen to within a few meters of the surface. Providing needed drainage can add substantially to water resource project costs and has frequently been deferred or neglected.

Inefficient water use in large irrigation projects—due to poor operation and maintenance, as well as to the absence of incentives for water conservation—have also exacerbated serious waterlogging and salinization problems. Excessive water losses in conveyance systems and field application have increased salt loadings in soils, drainage water, and aquifers. Many aquifers underlying irrigated areas have become so brackish that their usefulness has been impaired or destroyed.

This is not a new issue; 6,000 years ago on the Tigris-Euphrates floodplain in Mesopotamia, Sumerian irrigation practices led to a salt buildup in water and soils that contributed to the Sumerian cultural decline. Today, half the world's irrigated land is so badly salinized that yields are affected, with some 1 to 1.5 million hectares—mostly of prime agricultural land—becoming salinized each year. In India, waterlogging has made about 10 million hectares uncultivable and salinization threatens another 25 million hectares. In Pakistan, more than half the Indus Basin canal command system, some 12 million hectares, is waterlogged and 40 percent is saline. Salinization is also a persistent problem in the plains of eastern China, in Central Asia and Asia

Crop yields boosted by irrigation, as here in Pakistan, are now declining in many irrigated areas as a result of salinization and waterlogging.

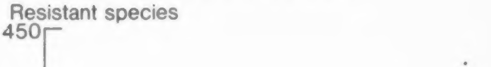
Minor, the Middle East and North Africa, and in North America. In the United States, including such highly productive areas as California's San Joaquin Valley, 20 to 25 percent of all irrigated land suffers decreased yields because of salinity.

Agricultural intensification has put other pressures on natural resources. Synthetic pesticides, use of which has risen sharply in the past 20 years, have had substantial ecological impacts. Previously unimportant insect species have emerged as major problems when their natural enemies have been reduced by pesticide applications. Many species have developed partial or complete resistance to a growing number of chemical pesticides. By 1980, 428 arthropods (insects, ticks, and mites) had developed resistance, along with more than 150 plant pathogens, 50 herbicide-resistant weeds, and 10 rodent and nematode (parasitic worm) species. Figure 2 shows how dramatically resistance has increased in recent years. Some crafty arthropods have been able to overcome the toxic effects of every pesticide to which they have been exposed, finally forcing farmers to abandon the crops on which they prey.[28]

Other environmental effects are also important. The World Health Organization estimates that hundreds of thousands of people die each year from acute pesticide poisoning. Through airborne drift, runoff into aquifers and drinking water supplies, residues on foodstuffs and other routes, chronic pesticide exposure is widespread and the risks uncertain. In the developed countries, most pesticides in use have not been thoroughly screened for health hazards, and developing countries still use those that have been banned elsewhere as excessively risky. Because malnutrition, infectious diseases, and other health problems are widely prevalent, developing country populations are particularly susceptible to pesticides' effects on the immune system.[29]

In sum, the fivefold increase in popu-

Figure 2. Species Resistant to Pesticides: 1940-1980



Source: G.P. Georghiou and R.B. Mellon, "Pesticide Resistance in Time and Space," in G.P. Georghiou and Tetsuo Saito (eds.). *Pest Resistance to Pesticides* (New York: Plenum Press, 1983) pp. 1-46.

lation since Malthus wrote has been accommodated with generally improving living conditions, although a billion people—the world's total population when he wrote—suffer severe deprivation and poverty, while another billion enjoy affluence he could not have imagined. A much larger share of the world's renewable resources—waters, soils, and living organisms—has been pressed into man's service. They have yielded up increasing production, but not without significant sacrifices of current and future productivity.

Effects on nonrenewable resources

Modern industry is based largely on minerals: fossil fuels, metals, and nonmetallic minerals. These are nonrenewable in the sense that supplies are extracted mostly from deposits formed by extremely slow geologic processes. However, metals can be recycled and hydrocarbons produced from plants if deposits become scarce enough. Nonrenewability is largely an economic concept.

Industrialization has enormously increased the production and use of many minerals. World steel output has risen 70 times over in this century. Aluminum output has risen more than 1,700 times. Production of some minor metals, such as molybdenum, has grown even more rapidly from small beginnings. Fossil fuel energy use also expanded rapidly. While coal production has increased only about seven times over this century, petroleum production has risen 125 times, an average annual growth rate exceeding 6 percent.[30]

This phenomenal growth is linked primarily to increasing per capita incomes and consumption standards in wealthy countries and only secondarily to population growth in the poorer countries, where food accounts for at least two-thirds of people's consumption budgets and agricultural production technologies are relatively labor-intensive.

Cumulative mineral production over these years has exceeded the known reserves at the beginning of the century by huge margins. Yet, far from running out, stocks of almost all minerals have increased. Table 7 demonstrates with selected minerals that even from 1950 to 1980, production virtually exhausted the initial reserves but reserves nonetheless were much higher at the end of the period. In other words, mineral reserves apparently increase in pace with the rate of extraction.

Table 7. World Reserves and Cumulative Production of Selected Minerals: 1950-1980

(Million metric tons of metal content)

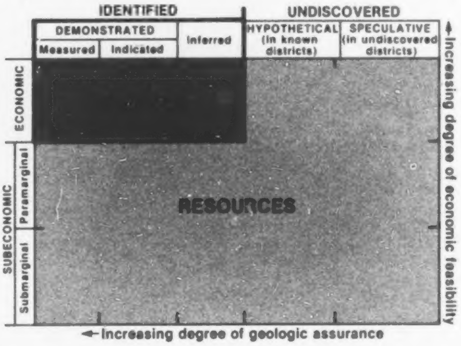
Mineral	1950 reserves	Production 1950-80	1980 reserves
Aluminum	1,400	1,346	5,200
Copper	100	156	494
Iron	19,000	11,040	93,466
Lead	40	85	127

Source: William Vogeley, "Nonfuel Minerals and the World Economy," in Robert Repetto (ed.), *The Global Possible: Resources, Development, and The New Century* (New Haven, Conn.: Yale University Press, 1985).

This apparent paradox is easily dispelled by realizing that stated reserves are like a working inventory of materials known to be available and economically suitable for extraction. Unlike total mineral "resources," which refer to the amounts of materials physically present in the earth's crust, reserves are conventionally defined as the quantities known with reasonable certainty to be economically recoverable with available technology and at specified prices. The distinction is illustrated in Figure 3 (page 24), which depicts reserves as the subset of total resources with the most firmly established economic value.

Mineral reserves depend on prices, technology, and knowledge. As mineral prices rise or extraction costs fall, reserves usually increase because submarginal deposits become economical to recover and more exploration becomes worthwhile. There have been enormous improvements in the technologies used

Figure 3. Total Resource Base


IDENTIFIED
UNDISCOVERED
DEMONSTRATED
Measured
Indicated
Inferred
HYPOTHETICAL (in known districts)
SPECULATIVE (in undiscovered districts)
ECONOMIC
SUBECONOMIC
Paramarginal
Submarginal
RESOURCES
Increasing degree of economic feasibility
Increasing degree of geologic assurance

Source: Donald A. Brobst, "Fundamental Concepts for the Analysis of Resource Availability," in V. Kerry Smith (ed.), *Scarcity and Growth Reconsidered* (Baltimore: Johns Hopkins Press for Resources for the Future, 1979) Figure 5.2.

to locate, extract, refine, and process mineral deposits that have made it feasible to exploit ores of much lower grade and to extract oil from the ocean depths and frozen north.

For this reason, although current production depends on such less accessible resources, minerals need not and have not become more scarce in an economic sense. Defining and measuring economic scarcity is not altogether straightforward. Increasing scarcity means that we must give up more of something else we value, but what? Our labor? Our capital? Our command over other commodities? Several measures of scarcity have been proposed and applied to mineral supplies. An influential 1963 study of long-run changes in resource scarcities by Harold Barnett and Chandler Morse relied mainly on trends in labor and capital costs in extractive industries.[31] An alternative measure is the relative prices of resource commodities, but again the question arises: "relative to what—the prices of nonextractive commodities or the price of all goods and services?" It could matter, because productivity has increased faster in industries producing commodities than in those providing services. Still other measures, such as the trend in rents paid to resource owners, can be defended on the Ricardian argument that the prices needed to justify exploitation of lower-grade deposits would provide increasing rents to owners of higher-grade reserves.

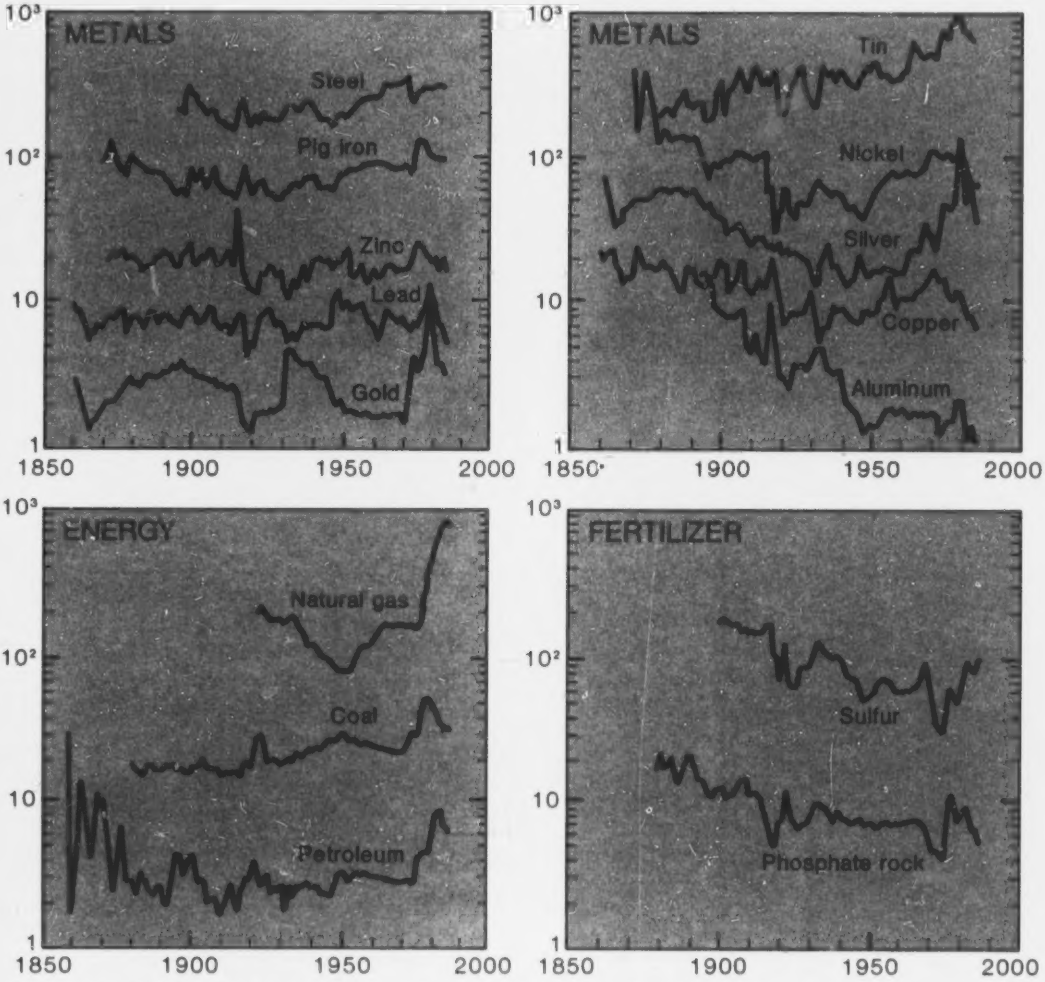
No single measure can give a completely reliable indication of trends in scarcity under all conditions. For example, improved technologies kept the costs of catching and killing whales from increasing even as whales approached extinction, suggesting a flaw in that measure. Commodity prices are influenced by changes in market structure, government policies, and prevailing expectations about the future that may have little to do with current scarcities. The steep rise in oil prices engineered by OPEC in 1973 reflected a change in market structure rather than a sudden large change in petroleum availability. Also, rents may actually decrease as an exhaustible resource becomes sufficiently scarce that substitutes become more economical.

Despite these potential ambiguities, the empirical record is relatively clear. In economic terms, exhaustible resources have not become significantly more scarce over the past century and, by some measures, most have become less scarce. This is illustrated in Figure 4, which shows U. S. prices in constant 1967 dollars from 1870 to 1985 for nine major metals, energy resources, and for sulfur and phosphate rock, major components of fertilizer. In constant dollars, these prices are generally no higher, and in many cases lower, than in the early decades of this century. Even the sharp rises in energy and other resource prices during the 1970s have been partially reversed so far in the 1980s.

Energy market changes during the past two decades illustrate the uncertainties surrounding resource scarcities. Their growing share of world production enabled OPEC producers to take control of petroleum supply from the international oil companies in the early 1970s, successfully raising prices from around $3 to about $13 per barrel. Although this reinforced world inflationary forces, real

Figure 4. U.S. Relative Price Trends for Major Resources: 1870-1985

(Prices in constant 1967 dollars)

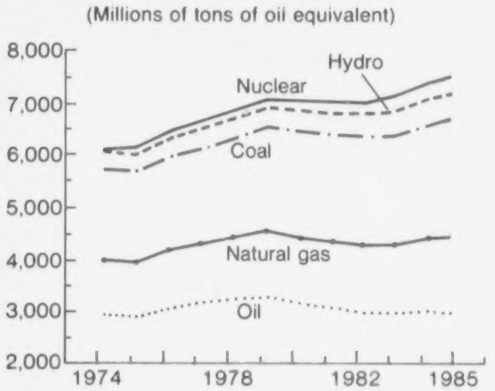


Sources: 1870-1976: Ulrich Petersen and R. Steven Maxwell, "Historical Mineral Production and Price Trends," *Mining Engineering*, Vol. 31, No. 1 (January 1979) pp. 30-31; 1977-1985: Commodity Research Bureau, *1985 CRB Commodity Year Book* (Jersey City, N.J.: 1985), and World Bank, *Commodity Trade and Price Trends* (Washington, D.C.: 1986).

petroleum prices stayed constant from 1975 until 1979, when the war between Iran and Iraq disrupted markets and allowed OPEC to raise prices to a peak of $34 per barrel in 1982, even though marginal production costs in the Middle East remained in the vicinity of $2 to $3 per barrel.

Market adjustments have been vigorous although sometimes painful. High oil prices stimulated exploration and production outside OPEC, in Mexico, the North Sea, and elsewhere. By 1985 OPEC's world market share had fallen to less than one-third (17 million barrels per day) from over half (31 million barrels per day) in 1973. Moreover, oil's overall share of commercial energy consumption fell sharply from 46 percent in 1974 to about 38 percent in 1985, as natural gas, coal, and hydroelectricity captured oil's industrial and utility mar-

Figure 5. World Commercial Energy Consumption: 1974-1985



Source: Christopher Flavin, Denis Hayes, and James Mackenzie, *The Oil Rollercoaster: A Call to Action* (Washington, D.C.: Fund for Renewable Energy and the Environment, 1987).

kets (see Figure 5). Finally, energy itself lost market share. In the United States, for example, total commercial energy use fell slightly between 1973 and 1986, despite a 34 percent increase in real GNP.

Severe recessions in 1975 and 1982 and relatively slow growth in the world economy during the past decade also cut energy demands. These forces combined to create increasing excess capacity among OPEC producers and excess supply on world oil markets in the 1980s. Members of the OPEC cartel were unable to agree on the production cutbacks necessary to maintain prices, which plummeted to a low of $8 per barrel in 1986 before recovering somewhat. In real terms, oil prices in mid-1987 are about at the 1975 level. Very recent experience shows that markets adjust equally to price rises and falls. In the U. S., 1986 petroleum output fell by 0.8 million barrels per day as marginal stripper wells were closed down while demand increased by half that amount, leading to a sharp upturn in imports.

Thus, history does not suggest that mineral price trends are inevitably downward. In most mineral industries, technological improvements have allowed lower-grade deposits to come into production without pushing up costs, but this balance is complex. It depends on how much ore there is in each cutoff grade (the percent of mineral within rock below which mining is not economically feasible) and on how fast productivity increases and demand for the mineral expands. In the copper industry, for example, switching from underground vein mining to nonselective open pit mining and developing a flotation process and other milling techniques that raised recovery rates from 65 to 95 percent allowed real copper prices to fall from 1900 through the 1930s even though the cutoff ore grade fell from 5 to about 0.7 percent. Thereafter, these new technologies were thoroughly assimilated and depletion of the resource base dominated rising copper prices through the 1970s.[32] This pattern is common to many mineral industries; resource prices seem to follow U-shaped rather than linear paths over the long run,[33] suggesting that the balance could shift from falling to rising prices in the future if demands grew strongly and technical change slackened.

Effects on environmental quality

Fundamental distinctions must be made between the effects of population growth on environmental quality in the richer and poorer countries. In most Third World cities, poverty and rapid urban population growth have resulted in appallingly poor environmental conditions for many or most inhabitants. Because urban land is scarce and expensive, millions of poor households inhabit unauthorized squatter settlements on marginal sites that are often without municipal water and waste disposal services. Such sites are often on inaccessible hillsides, in flood-prone depressions, or beside industrial and other undesirable zones. Poor households must sacrifice housing amentities for basic shelter near urban jobs.[34]

Third World cities have gradually improved and extended their infrastructure, as indicated by statistics on percentages of urban populations with access to such basic services as piped water. Moreover, studies show that individual households typically progess to better housing, employment, and living conditions as they stay in the city longer. However, the rapid pace of urban growth in the Third World creates a constantly expanding fringe population of newly arrived, impoverished migrants and underemployed young urban labor force entrants. Investments in urban infrastructure to keep pace with this expanding population are enormously expensive, and these people have very limited ability to pay for services.

Air and water quality in Third World cities is generally poor, widely violating the minimum health standards of the industrialized countries. Few large-scale and virtually no small-scale industries have effective pollution controls. The vehicle fleet is relatively old, poorly maintained, and also without the emissions controls required in industrial countries. Industrial wastewater and sewage flow untreated into rivers, canals, and bays in many Third World cities. While lack of effective environmental controls is the immediate cause of these conditions, rapid, helter-skelter urban growth that intermixes housing, small-scale and large industries in violation of any rational pattern or plan makes such control doubly difficult.

The absence of standardized monitoring extending back for any considerable period makes it impossible to generalize about long-term trends in urban air and water quality in the Third World, but available data do establish that pollution concentrations are substantially higher than in economically advanced countries and are not currently improving.[35]

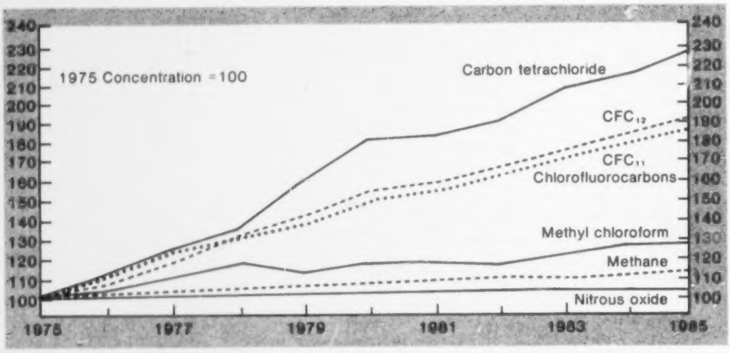
By contrast, most measures of urban environmental quality in economically advanced countries do show gradual improvement. Suspended solids and organic matter in most water bodies have been decreasing. Levels of conventionally measured air pollutants, such as carbon monoxide, sulfur dioxide, and airborne particulates, have also been diminishing. Moreover, despite increasing evidence of damage to forests and lakes from acid deposition, rain's acidity and atmospheric concentrations of sulfates and nitrates have not been increasing during the 1980s.[36]

Acid rain has damaged forests and lakes, as here in Canada, but enforcement of environmental regulations has gradually reduced some air and water pollution in developed countries.

The direct cause of these trends is the enforcement of environmental regulations limiting emissions from motor vehicles, industries, electric utilities, municipalities, and other major pollution sources. Population trends in the industrial countries have had little effect on these indicators of environmental quality.

The importance of environmental regulation is clear in the contrasting trends between these regulated pollutants and other weakly controlled or totally uncontrolled emissions. The most important of these are carbon dioxide and atmospheric trace gases, such as chlorofluorocarbons, nitrous oxides, and methane, that contribute to global greenhouse warming and also reduce the concentration of stratospheric ozone, which

Figure 6. Atmospheric Concentrations of Environmentally Important Trace Gases: 1975-1985



Source: IIED and WRI, *World Resources 1987*, Figure 25.1, p. 334.

is crucial in shielding the earth's surface against ultraviolet radiation. Estimated global emissions of carbon dioxide from the use of fossil fuels and burning of biomass have nearly tripled since 1950. Emissions of the most active chlorofluorocarbons have increased from neglible amounts to almost 700,000 metric tons per year in 1985. Annual emissions have nearly climbed back to the peak levels of the early 1970s, before the use of chlorofluorocarbons in aerosol spray cans was controlled in the U. S., Canada, and Sweden, as other uses have increased, such as in refrigeration, foam-blowing, and solvents.

Figure 6 shows rising trends in atmospheric concentrations of these environmentally important trace gases. The concentration of carbon dioxide (not shown in Figure 6) has already risen about 25 percent over preindustrial levels. Estimates based on samples of air trapped in ice cores suggest that the methane concentration has doubled. Together with rising concentrations of other greenhouse gases, these trends imply that a warming of the earth's surface by 1.5 to 4.5 degrees Centigrade is already inevitable, according to some modeling estimates.[37] This is a significant shift; during the Little Ice Age of the 14th and 15th centuries in Europe, mean temperatures were only 1 Centigrade degree lower than today's. A global warming of 1.5 to 4.5 degrees would lead to a sea-level rise of 20 to 140 centimeters and reduce rainfall and thus crop yields, among other effects.

In sum, population growth rates are not the dominant influence on environmental quality, although very rapid urbanization in the Third World is undoubtedly a significant factor. The effectiveness of environmental controls and the pace and pattern of industrialization are evidently more critical. The record indicates that emissions and other environmental impacts can be controlled within manageable cost levels, provided that legal, regulatory, and incentive programs work.

Consequences of Future Population Growth

The rate at which population growth will subside over the next century in the developing countries is highly speculative and, consequently, so is the ultimate size of the human population. The current United Nations medium estimate of 10.2 billion could easily be off by several billion. In relative terms, even future population growth rates or declines in the economically advanced countries are uncertain.

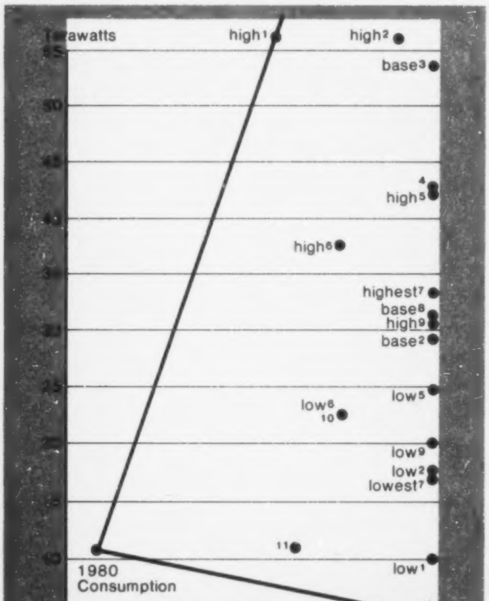
Energy consumption

The same uncertainty pervades long-term projections of future demands for resources, of which energy resources are by far the most critical. Until the oil "shocks" of the 1970s, energy demands were widely thought to be related straightforwardly to growth in population and per capita income. The market adjustments to higher prices that brought energy demands in the industrial countries to a virtual standstill surprised even some energy analysts. Demand forecasts over the past decade have been consistently excessive, and resulted in considerable excess capacity in energy industries.

The longer-term future is even more clouded. Figure 7 presents 19 recent projections of total world primary energy consumption in the period to 2050. They reflect varying "high" and "low" estimates of future population and economic growth and sharply differing assumptions about the extent of future energy conservation. When projected over a half century and more into the future, their implications are profoundly different.

The high estimates range up to more than five times the estimated 10.3 terawatts of energy consumed worldwide in 1980. This implies a tremendous expansion in supplies. The increase in fossil fuel use (assuming that new reserves would be discovered and developed) would mean bringing a new Alaskan oil pipeline into operation every two or three years, while the growth in nuclear generating capacity would necessitate commissioning new one-gigawatt nuclear power plants every two or three days. If these projections should prove to be accurate, concentrations of greenhouse

Figure 7. Recent Long-Term Projections of World Primary Energy Consumption to 2050



Source: WRI and IIED, *World Resources 1986* (New York: Basic Books, 1986) Figure 7.7, p. 115

Note: The 19 projections appear in the 12 studies listed below. Several represent a range of projections ("high," "base," and "low," for example) produced by varying assumptions used in the same study.

[1] W.D. Nordhaus and G. Yohe, "Future Paths of Energy and Carbon Dioxide Emissions," *Changing Climate* (Washington, D.C.: National Academy of Sciences, 1983).

[2] J.S. Edmonds et al., *An Analysis of Possible Future Atmospheric Retention of Fossil Fuel CO_2* (Washington, D.C.: Department of Energy, 1984).

[3] J. Edmonds and J. Reilly, "Global Energy and CO_2 to the Year 2050," *Energy Journal*, Vol. 4, No. 3 (1983) pp. 21-47.

[4] V.A. Legazov, I.I. Kuzmin, et al., "The Influence of Energetics on Climate," *Fizika Atmospheri i Okeana*, Vol. 11 (USSR Academy of Sciences, 1984) pp. 1089-1103.

[5] D.B. Reister, *An Assessment of the Contribution of Gas to the Global Emissions of Carbon Dioxide* (Chicago: Gas Research Institute, 1984).

[6] International Institute of Applied Systems Analysis (IIASA), *Energy in a Finite World—A Global Systems Analysis* (Cambridge, Mass.: Ballinger, 1981).

[7] D.J. Rose, M.M. Miller, et al., *Global Energy Futures and CO_2—Induced Climate Change* (Cambridge, Mass.: MIT Energy Laboratory, 1983).

[8] S. Seidel and D. Keyes, *Can We Delay a Greenhouse Warming?* (Washington, D.C.: Environmental Protection Agency, 1983).

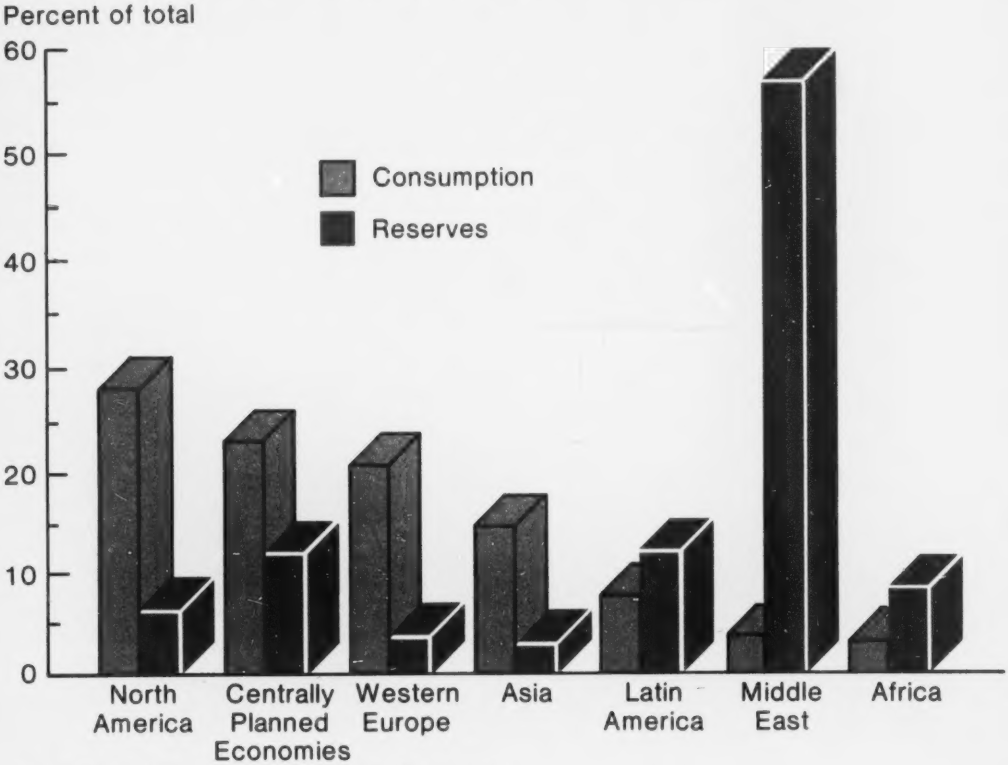
[9] World Energy Conference, *Energy 2000-2020: World Prospects and Regional Stresses* (London: Graham and Trotman, 1983).

[10] H.H. Rogner (ed.), *IIASA '83 Scenario of Energy Development: Summary* (Laxenburg, Austria: IIASA, 1983).

[11] J. Goldemberg et al., "An End-Use Oriented Global Energy Strategy," *Annual Review of Energy*, Vol. 10 (1985) p. 649.

[12] A.B. Lovins, L.H. Lovins et al., *Least Cost Energy: Solving the CO_2 Problem* (Andover, Mass.: Brick House, 1981).

Figure 8. Regional Oil Consumption and Reserves: 1985



Source: Flavin, Hayes, and Mackenzie, *The Oil Rollercoaster.*

gases and global temperatures would rise sharply and up to 4 million kilograms of plutonium would be recovered from spent nuclear reactor fuel each year and circulated in global commerce, greatly increasing the threat of nuclear weapons proliferation. (Only 5 to 10 kilograms of plutonium are required to make a nuclear weapon.)

The low estimates imply a tremendous effort to implement all feasible energy conservation strategies, such that per capita energy use in the industrial countries would fall by almost half from the 1980 level. All buildings would have to incorporate thorough insulation and energy-saving appliances; the entire vehicle fleet would have to be replaced by the most fuel-efficient vehicles now available; all industries would have to install highly energy-efficient motors, furnaces, and other equipment. Between these extremes there obviously lies a wide range of feasible possibilities.

The very recent discoveries of new materials that become superconductors at much higher temperatures than had been thought possible dramatically underscore technological uncertainties. Such superconductors may allow economical long-distance electricity transmission with minimal resistance loss, large-scale energy storage, much more efficient engines, and other developments that will greatly increase the productivity of primary energy sources. Physicists see these breakthroughs as having the same potential impact as the invention of the transistor. Yet, they have not so far been factored into any projections of future energy consumption.

Long-run oil supplies are also highly

uncertain. Although the United States and some other regions have been thoroughly investigated, there remains much to be explored in strata below 10,000 to 15,000 feet, in offshore fields, and in some developing countries. Natural gas deposits have been less thoroughly investigated than oilfields. However, the greatest long-run uncertainties are economic and technological, rather than geologic. Huge known deposits of tar sands, oil shale, heavy oil, coal, and presently unrecoverable oil in existing fields represent enough potential liquid or gaseous hydrocarbons for hundreds of years of consumption, but with current price ranges and available technologies, recovery is economically and environmentally infeasible. Whether prices and technologies will change enough to bring these potential resources into the reserve base is a major uncertainty.

The relatively short-term supply prospect is clearer. Excluding "unconventional" resources, oil reserves will be under pressure within the next 20 to 40 years, depending on the rates of demand growth and new discoveries. Well before then, the Middle East will likely regain the market power that resulted in the 1970s oil price shocks. Figure 8 depicts regional oil consumption and reserves in 1985. The Middle East's preponderance of reserves is striking. Also, production and exploration costs there are far below costs in other regions. Well within a decade, unless policies are adopted to curtail demand, slack in world oil markets is likely to disappear, opening the way for the resurgence of the OPEC cartel.

What actually happens will depend on market forces, but forces shaped and directed by public policies. Governments act to increase energy supplies (through fiscal incentives and subsidized research) or to decrease them (through environmental and safety regulations, for example). Governments also intervene extensively to influence both the composition and level of energy demand, through taxes, subsidies, regulation, and other means.

Nonfuel minerals

Similar uncertainties affect projections of the future demand for nonfuel minerals. As Table 8 shows, for example, even projections made in 1975 and 1978 of the U. S. demand for metals in 1985 were much higher than the actual demand in 1985. This was largely because of significant structural changes in mineral-based industries. Since about 1960 in the United States and other industrialized countries, consumption of most basic materials has fallen rapidly relative to GNP and has remained constant or declined in per capita terms. Figures 9 and 10 (pages 32 and 33) show these trends in the United States for major materials and minor metals. Improved efficiency in using materials, use of cheaper materials or those with more desirable characteristics, saturated traditional markets, and shifts in consumer demand to less materials-intensive products and services are responsible.

These structural shifts may cause serious errors in long-term projections of mineral demands, such as that given in Table

Table 8. Projections of U.S. Metal Demand in 1985 Versus Actual Demand

(Ratio of demand in 1985 to average for the period 1971-1975)

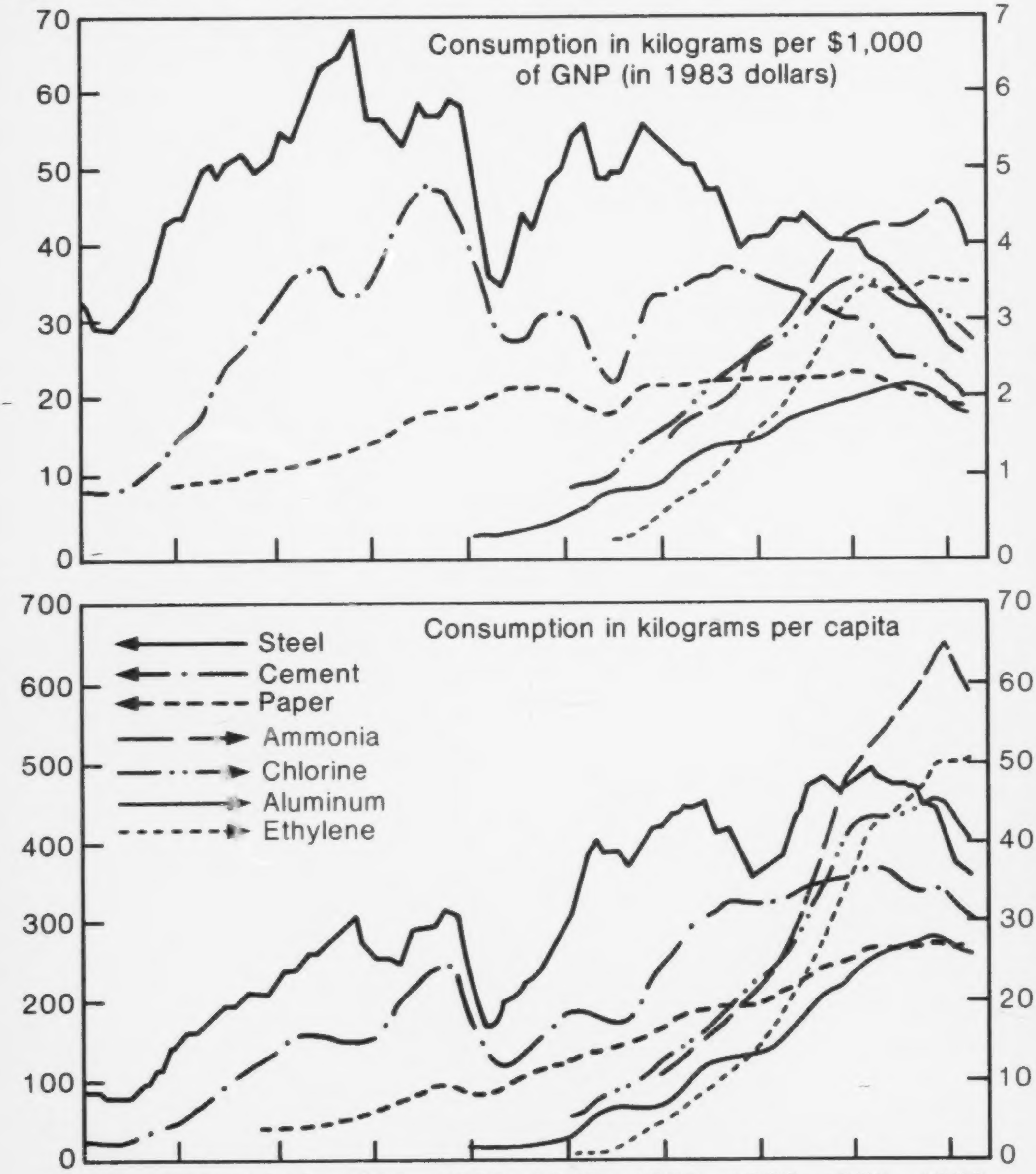
Metal	Projected 1975[a]	Projected 1978[b]	Actual 1985
Aluminum	2.12	1.69	1.04
Chromium	1.65	1.08	0.73
Cobalt	1.50	1.48	0.86
Copper	1.66	1.38	1.10
Manganese	1.38	1.13	0.47
Nickel	1.71	1.31	0.79
Steel	1.40	1.24	0.87
Tin	1.11	1.12	0.70
Tungsten	2.01	1.29	1.17
Zinc	1.76	1.38	0.78

Source: Robert H. Williams, Eric D. Larson, and Marc H. Ross, "Materials, Affluence, and Industrial Energy Use," Center for Energy and Environmental Studies, Princeton University, March 1987.

[a] U.S. Department of the Interior, Bureau of Mines, *Mineral Facts and Problems* (Washington, D.C.: 1975).

[b] Wilfred Malenbaum, *World Demand for Raw Materials, 1985 and 2000* (New York: McGraw Hill, 1978).

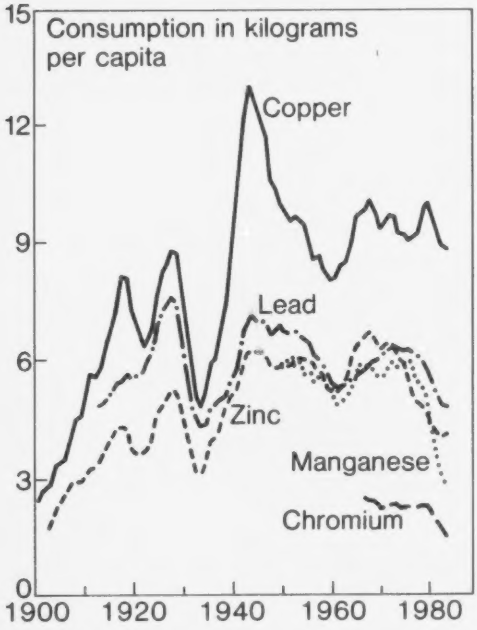
Figure 9. U.S. Consumption of Major Materials: 1890-1985



Source: Robert H. Williams, Eric D. Larson, and Marc H. Ross, "Materials, Affluence, and Industrial Energy Use," Center for Energy and Environmental Studies, Princeton University, March 1987.

9, which assumes, contrary to recent experience, that U. S. mineral demands will grow much faster than population over the 40 years from 1986 through 2025. Global projections are also uncertain. In the early stage of materials' life cycles, market penetration and falling production costs result in rapid growth of demand, or consumption. Stages of slower growth and stagnation follow. Industrializing countries are

Figure 10. U.S. Consumption of Minor Metals: 1900-1985



Source. See Figure 9.

Table 9. Projected Growth Rates of U.S. Population, GNP, and Mineral Demands: 1971-2025

(Average annual percent increase)

Indicator and mineral	1971-85	1986-2000	2001-25
Population	0.93	0.74	0.56
GNP	2.91	2.90	2.19
GNP per capita	1.98	2.15	1.63
Aluminum	4.83	3.21	2.81
Chromium	3.01	2.20	1.92
Cobalt	3.40	1.63	2.54
Copper	2.15	1.07	0.99
Iron in ore	1.18	1.55	1.46
Lead	1.78	1.74	1.35
Manganese	2.37	1.83	2.32
Molybdenum	2.20	1.61	1.76
Nickel	3.17	2.32	2.16
Phosphate rock	3.38	1.74	0.82
Potash	2.37	1.33	0.87
Sulfur	1.97	2.29	1.62
Tin	2.16	1.61	1.93
Titanium	2.26	2.17	1.90
Tungsten	3.90	1.63	1.87
Vanadium	2.89	1.95	1.72
Zinc	2.36	1.55	1.66

Source: Ronald G. Ridker and William D. Watson, Jr., *To Choose a Future: Resource and Environmental Problems of the U.S., A Long-Term Global Outlook* (Baltimore: Johns Hopkins Press for Resources for the Future, 1980).

in the cycle's early stages, but as per capita incomes rise, they will likely follow the path taken by mature economies.

Scarcity of nonfuel minerals is unlikely to constrain that growth path, although the developing countries will ultimately be the larger source of demand. With the exception of fossil fuels and a few others, the materials most widely used and economically important are available in virtually inexhaustible supplies. Basic life-supporting materials, such as calcium, nitrogen, sodium, and potassium, are available in essentially infinite supply. The possible exceptions are phosphorus, of which there are known high-grade resources to support 500 years of agricultural demand, and a few other trace elements needed in agriculture, such as copper and zinc.[38] Important metals, such as iron, aluminum, and manganese, can be recovered indefinitely from lower-grade ores at manageable cost.

For other materials, substitution possibilities are increasingly ample. Materials' characteristics, such as strength, electrical conductivity, reactivity, and corrosivity, determine current demands. Scientists can now design materials with desirable properties and develop lower-cost subsititutes for more limited materials. For example, modern ceramics (produced from clay, dirt, etc.) can be used advantageously in place of metal alloys for piston caps, cylinder liners, and other critical engine parts, reducing cooling costs, and as high-performance cutting tools.

For this reason, concerns about "critical" materials usually prove to be exaggerated. In 1978 a cobalt mine strike in Zaire, which provides over half the world's supply, set off panic buying that drove the world price from $11 to $120 per kilogram.

Since then, cobalt use has persisted in catalysts and in superalloys for jet engines, for which few commercial substitutes exist, but overall U. S. consumption has fallen by half. Ceramic (ferrite) magnets have replaced cobalt alloy magnets; manganese has replaced cobalt in paints; and other alloys have replaced cobalt in cutting tools.[39] Even materials derived from limited or geographically concentrated deposits typically have substitutes across most uses, and alternative supply sources, such as recycling, for the rest.

Agricultural resources

Population growth's most direct impact will be not on mineral but on agricultural resources. A world population twice its present size and improving dietary standards in the Third World imply at least a threefold increase in the demand for basic calories, equivalent to an increase to about 10 billion tons of grain each year. To produce this much, all the world's current cropland, including land under permanent crops, would have to yield 7 tons of foodgrain per hectare per year, about what Iowa corn farmers achieve. At present, the average world crop yield per year is 2.3 tons per hectare, and Indian farmers without irrigation manage less than half that much.[40]

Even such crude orders of magnitude raise questions of whether agricultural production can achieve these levels for food crops plus a margin for nonfood crops without severe pressures on other ecosystems. In fact, the world's cropped area can still increase substantially. An FAO assessment of 90 developing countries (excluding China) found that less than half the potential cropped area is now cultivated, and considerable farmland has been idled in the United States and other developed countries. However, the available land (and water) is not in the densely populated countries of China, the Indian subcontinent, Java, Egypt, and the Middle East that account for most of the developing world population, but in North and South America, Oceania, and parts of Africa, where population is relatively sparse.[41] Extending production on open lands implies a vast expansion of world foodgrain exports, which must be offset by exports of manufactures from food-deficit countries. Extending cultivation in the tropics, apart from its impacts on forests and grasslands, depends on solving problems of soil fertility, pests, and diseases.

For all major crops in the developing countries, there are substantial yield reserves, the differences between current averages and those obtainable with known applicable farming methods. Table 10 suggests that cereal yields could triple if input supplies, technical information, farmer incentives, and other preconditions promoted widespread adoption of those techniques. Therefore, expansion of food production to meet the needs of future populations seems within the realm of current possibilities.

The big uncertainty over the long run is the impact genetic engineering will have on agricultural production. Vaccines produced through biotechnology are already available for important livestock diseases, and livestock growth hormones that raise feed efficiency from 25 to 40 percent will shortly be available in commercial quantities. Researchers are altering nitrogen-fixing bacteria to work more effectively and to infect crops other than legumes, which will reduce dependence on chemical fertilizers and raise crop yields on nitrogen-poor tropical soils.

Scientists are also working toward the capacity to alter the genetic makeup of agriculturally important plants by investigating the genetic determinants of key characteristics and by finding means to introduce new genetic material into plant cells. In many respects, progress is outpacing expectations.[42] Ultimately, scientists hope to develop plant varieties with greater photosynthetic efficiency and resistance to such environmental stresses as drought, flooding, salinity, disease, pests, and temperature extremes. The implications for agricultural yields and the use of lands that are now marginal or unavailable for crop production are obviously enormous. According to the National Re-

Table 10. Potential Yields for Cereals in 90 Developing Countries, by Land Class

(Potential yields[a] in 2000 as percent of actual yields in 1974-76)

Cereal	90 developing countries	Land class[b] Ample rainfall	Low rainfall	Naturally flooded	Fully irrigated	Partially irrigated	Problem area
Barley	308.2	339.4	229.0	203.9	278.1	265.0	352.9
Maize	348.6	356.6	157.4	351.3	229.1	306.6	418.0
Rice	256.5	221.6	—	230.2	228.8	257.6	254.8
Wheat	290.7	302.8	377.1	227.3	289.2	227.1	372.0
Other cereals	409.1	511.3	307.7	184.1	224.2	305.6	431.0

Source: Janos P. Hbravosky, "Agriculture: The Land Base," in Repetto, *The Global Possible*, Table 8.9, p. 232

[a] Potential yields reflect a known technology that is applicable to the area considered.

[b] According to Food and Agriculture Organization, *Agriculture: Toward 2000* project data.

search Council on Agriculture, the tools now being developed for genetic engineering "will likely have an impact on agriculture comparable to that of Mendel's laws of inheritance in the late 1800s."[43] Such scientific changes will likely make long-run forecasts based on existing agronomic technologies highly unreliable.

Adaptations to Population Growth

Innovation is one consistently demonstrated response to scarcity, whether from population growth or other sources. Scientific and technological innovation is rapid in the advanced countries, but change transforms simpler economies as well. Studies of variations in farming practices and land tenure arrangements in Africa demonstrate adaptations to dense population or high demands from nearby market centers.[44]

Table 11 (page 36) shows how farming operations and technology intensify as farming systems progress from forest fallow to multiple cropping. Increasing population pressure induces farmers to use land and available labor more intensively. Fallow periods shorten and more labor hours are used to control weeds and provide supplemental soil nutrients. When farming shifts to annual or multiple cropping, green manures and animal wastes are required to maintain fertility. Since these require substantial additional labor and land inputs, eventually chemical fertilizers become economical.

There is a corresponding evolution in land preparation. When land is abundant, the lighter mid-slope soils tend to be cultivated first with hoes and other simple tools. These soils may be relatively susceptible to erosion, so labor-intensive construction of bunds, ridges, and terraces often evolves as farming pressure increases. Typically, increasing agricultural demands also induce cultivation of fertile bottomlands with heavy soils that are harder to work and often require water control. By this stage, the energy requirements justify keeping draft animals and investments in heavier farm equipment.

As long-term investments in land increase, observers have found that land tenure rights also evolve from general-use rights conferred by community membership toward specific individual property rights. Increasing fixed investments in stump clearance, land leveling, terracing, drainage, and irrigation require assurance that the benefits accrue to the investor and heirs.

Evidence of such agricultural adaptations can be found in Africa and elsewhere in the Third World, paralleling the earlier agricultural history of Europe. Population growth is one stimulus to change, but it is not clear that such farmer-generated innovations can raise

Table 11. Operations and Technology Used in Tropical African Farming Systems

Operations	Forest fallow	Brush fallow	Short fallow
Land clearance	Fire	Fire	None
Land preparation	No land preparation Sticks used to plant roots and sow seeds	Land is loosened with hoes and sticks	Plow used to to prepare land
Manure use	— Ash — Household refuse for garden plots	Ash, leaves, other vegetable matter and turf from surrounding bushland	— Animal and human waste — Green manuring — Composts — Silt from canals
Weeding	Minimal	Required as fallow period shortens	Required during growing season
Use of animals in farming	None	Animal-drawn plows appear as fallow period shortens	Plowing, transport, interculture
Seasonality of labor demand	None	None	Land preparation, weeding, harvesting
Fodder supply	None	Emergence of grazing land	Abundant free grazing land

Source: Prabhu Pingali and Hans P. Binswanger, "Population Density and Agricultural Intensification: A Study of the Evolution of Technologies in Tropical Agriculture," World Bank, Agriculture and Rural Development Department, Washington, D.C., 1984.

yields at the pace required by exceptionally rapid rates of population growth in sub-Saharan Africa and some other developing countries. Over the long run, European agricultural output grew at 1 to 2 percent per year, whereas Africa's current demographic growth, ranging up to nearly 4 percent a year, requires rates at least twice as high.

Rapid adaptation is neither assured nor automatic. Household and village institutions, such as rules governing inheritance and community membership, mediate responses to population pressures. Government actions that influence the prices farmers receive for their products, the security farmers have in their holdings, the costs and availability of inputs and information, and access to markets also affect agricultural adaptation. In many countries, especially in Africa and Latin America, political instability and policy biases against agriculture have retarded agricultural development.

It is not surprising that the empirical association between measures of population pressure and agricultural intensification is weak. Such pressures can be measured by population density or FAO's more complex measure of "carrying capacity," or changes in those statistics over time. However measured, there is not much correlation between population pressure and indicators of agricultural intensification in countries of sub-Saharan Africa and elsewhere in the Third World.[45]

Similarly, the process of adapting communal tenure rights that are imbedded in political and cultural traditions often proceeds slowly and sporadically. More intensive cultivation on hillsides in semi-arid regions may result in serious land degradation despite the tendency toward greater investment and more secure tenures. When private tenures are established over arable land, problems of controlling access to and use of communal forest and grazing lands usually persist (see box on India, page 18). Adaptation to population growth through local institutional and agronomic change can proceed too slowly to forestall land degradation and falling per capita produc-

Annual cropping	Multiple cropping
None	None
Animal-drawn plows and tractors	Animal-drawn plows and tractors
— Animal and human waste — Composting — Cultivated green manure crops — Chemical fertilizer	— Animal and human waste — Composting — Cultivated green manure crops — Chemical fertilizer
Intensive during growing season	Intensive during growing seasons
Plowing, transport, interculture, post-harvest tasks, irrigation	Plowing, transport, interculture, post-harvest tasks, irrigation
High demand during rainy season and harvest	High demand during land preparation, weeding, harvest, post-harvest
Free grazing during fallow period, crop residues	Intensive fodder management and fodder crop production

tion, as has occurrred in Africa over past decades.

Innovations based on modern science depend both on demand, expressed largely through economic opportunities, and on supply factors, such as the capability to generate, adapt, and apply technical research. The poorest countries, where population growth is generally highest, are at a considerable disadvantage. The scientific and technical innovations developed in advanced countries are sometimes irrelevant or inappropriate to the needs of their markedly different expenditure patterns, production technologies, and input prices. Research and development efforts (and personnel) are attracted to the larger market opportunities of the rich countries.

The availability of scientifically and technically educated specialists in the industrialized world facilitates research and development. Table 12 shows that 90 percent of all scientists and engineers engaged in research and development in 1980 worked in developed countries, and well over 90 percent of research and development dollars are spent there. In sub-Saharan Africa (Africa excluding Arab states), only about 45 scientists and engineers were engaged in research and development for every million people in 1980, compared to nearly 2,900 per million in developed countries as a whole. While many developing countries have raised their capacities for applied research in agriculture, health, and other fields, enormous disparities remain between them and the advanced countries. These differentials are reinforced by the lower average education of the total work force in developing countries, which affects the pace at which innovations are adopted.

The poorest countries have not participated fully in the international diffusion of technology that has brought productivity levels closer together among more advanced economies. Laggards among the now industrialized countries have largely caught up with countries such as the United Kingdom and Australia that had the highest levels of output per worker a century ago. Since 1870 among industrial countries, whether centrally planned or market economies, out-

Table 12. Scientists and Engineers Engaged in Research and Development, by Region: 1980

Region	Estimated number	Estimated number per million population
World total	3,756,100	843
Developed countries	3,359,102	2,875
Developing countries	396,998	121
Africa (excluding Arab states)	16,387	45
Asia (excluding Arab states)	693,659	273
Arab states	33,686	206
North America	674,725	2,679
Latin America and the Caribbean	90,936	251

Source: UNESCO, *1986 Statistical Yearbook* (Paris: 1986) Table 5.4.

put per worker has tended to grow fastest in countries where it was initially lowest. In the post-World War II period, newly industrializing countries such as Japan, Korea, Singapore, and Brazil have joined an accelerating process of convergence, as capital and technology have become increasingly mobile internationally.[46]

This long-term process of convergence in productivity and living standards should provide comfort and hope to developing nations. However, the poorest countries have not participated in this convergence. Productivity growth for those countries, on average, has been relatively slow, and there is no discernible tendency for those with the lowest per capita output to catch up. One reason may be that low-income, agricultural countries such as Sudan or Bangladesh cannot readily adopt Western advances in capital-intensive and high-tech industries, while countries such as Japan, Brazil, and Singapore with established industrial and scientific bases can. Although international agricultural research efforts, such as those sparked by the International Rice Research Institute in the Philippines and the International Center for the Improvement of Maize and Wheat in Mexico, have done much to raise yields in developing countries, the effects have been felt mainly on more modern irrigated farms using relatively high levels of purchased inputs.

The demographic dualism that the next century holds, with populations holding steady or declining in developed countries and at least doubling in developing countries, may slow down the process of convergence and promote a corresponding economic and environmental dualism. The more dissimilar are the industrial structures of the poor and the advanced countries, their relative factor scarcities, and their endowments of technically trained workers, the more difficult it may be for the poor countries to adapt and use the rich countries' technological advances. Moreover, with stable demands on natural resources and high per capita incomes, the rich countries will find it much easier to maintain environmental quality than poor countries in which rural and urban populations are growing, pressures on natural resources are increasing, and investment funds are stretched to provide employment for increasing labor forces and infrastructure for expanding cities.

Room to Maneuver

The broad trends and tendencies described in this *Bulletin* admit a wide range of possibilities. In every dimension of development, best-performing nations are far above the average.[47] There is ample room for communities and countries facing natural resource pressures to maneuver. Historically, many nations with extremely limited natural resources have built successful economies and even empires on skills in trade and manufacture. Venice, Holland, Portugal, even England overcame severe resource limitations in this way.[48] Japan, Korea, Singapore, and Hong Kong demonstrate that the strategy is still viable. Despite an almost complete absence of natural resources, the Republic of Korea has raised per capita output fivefold over the past 25 years and has become a major industrial exporter.

Similar progress is possible in agriculture, despite resource limitations. China, although having only about 0.1 hectares of already intensively cultivated arable land per capita, has raised net agricultural output since 1978 at an average rate of about 7 percent per year, largely by putting more land under individual household management and improving farmers' incentives.

In sub-Saharan Africa, Malawi's agricultural output has increased by more than 7 percent annually since 1973, although its rural population density of 59 people per square kilometer is the third highest in Africa and the typical land holding is less than 2 hectares. Malawi's President Kamuzu Banda is also Minister of Agriculture and has promoted diversified cash crops, agricultural research and extension for small farmers, output prices that remunerate farmers adequately, and

Wise management of limited resources has dramatically increased agricultural output in Malawi.

investments in rural road networks, education, and other infrastucture.[49]

The key is managing available resources wisely. Too often, current practices and policies promote waste and degradation of the resource base, at heavy economic and environmental cost. Successful experiences demonstrate that there is enormous scope for improvement in resource use. Better management can alleviate apparent and threatened resource scarcities by greatly enhancing resource productivity.

Agricultural policies provide good examples. In most developing countries, agricultural prices are kept low to benefit the urban minority, and public investment supports the urban sector. This, along with concentrated landholdings and other factors, discourages more productive use of good agricultural land and impels the rural poor onto more marginal soils. On the other hand, in the United States, Japan, and Europe, agricultural prices are kept high to benefit the rural minority, inducing farmers to use high levels of chemicals, water, and other inputs to produce costly surpluses, while degrading rivers and aquifers.[50]

Such policies retard constructive innovation while adding to environmental pressures. Scientists are developing simple farming systems for tropical areas that preserve soil fertility by reducing erosion and increasing organic nutrient availability. For example, the International Institute of Tropical Agriculture has developed a system of alley cropping that raises yields 40 percent by intercropping maize or cassava between rows of severely pruned leguminous trees that provide wind protection, water retention, organic mulch, and residual soil nitrogen.[51] However, most governments heavily subsidize chemical fertilizers, lowering the cost to farmers of compensating for lost soil fertility and discouraging use of organic nutrients. Scientists have also developed integrated pest management programs for rice and other tropical crops that minimize the need for chemical pesticides, but many governments maintain generous pesticide subsidies that reduce farmers' incentives to adopt such programs.[52]

Similar anomalies deter progess in using energy resources more productively. Most developing countries rely heavily on biomass energy, especially fuelwood. Many countries that suffer acute shortages of wood for fuel and other uses have nonetheless kept timber prices far below the cost of replacing the wood harvest with forestry plantations, and have deterred replanting even further by not establishing and enforcing clear property rights to standing timber. When China reversed these policies by letting households and cooperatives establish plantations on uncultivated land and sell the harvest at prices negotiated with buyers, the results were impressive. Since 1977 more than 50 million hectares of new plantations have been established, an area half as large as all China's cropland, and wood supplies have increased correspondingly.

In the industrial countries, as indicated by the divergent projections shown in Figure 7 (page 29), there are enormous unrealized opportunities for energy conser-

Tree farming in Costa Rica. Policies to produce wood more efficiently could overcome acute shortages in the many developing countries that rely heavily on fuelwood for energy.

vation through improved energy efficiency. Some arise from the application of semiconductors, superconductors, and other sophisticated technology. Others can be realized through such simple investments as improved insulation and installation of more efficient lighting and motors. Such investments often pay for themselves several times over the life of the installation in reduced energy costs.

The potential energy savings would substantially reduce dependence on energy imports, emissions of greenhouse gases, acid deposition, and other energy-related environmental pressures without sacrificing economic welfare. Yet, government policies in most industrial countries still favor increased energy supply over energy savings. Energy-supply industries are subsidized through a variety of fiscal measures. Prices to energy users are held beneath the true marginal supply costs through rate regulations, and various institutional arrangements deter energy conservation.[53]

Similar opportunities abound to manage other resources more efficiently. Water, consumed mainly in agriculture, is increasingly scarce in many semi-arid areas. In the western United States, for example, virtually all river water has been appropriated and deficits are being met by depleting underground aquifers. Yet current institutions and policies prevent water's reallocation from low- to high-value uses and provide few incentives to users to reduce waste.[54] The same situation prevails in water-scarce countries in the developing world.[55]

Tropical forests, the world's richest and least understood ecosystem, are rapidly disappearing not only because of encroachment by rural populations but also because misguided government policies encourage large-scale conversion to ranches and agricultural settlements, many of which represent inappropriate land uses and could not exist without heavy government subsidies. Timber booms in many tropical countries richly endowed with forests, such as Indonesia and the Philippines, have depleted the resource very rapidly and wastefully, because low royalties and taxes sacrificed much of the economic value of rich government-owned tropical hardwood forests to logging concessionaires, creating enormous short-run profits.[56] Typically, shifting cultivators travel the abandoned logging roads, clearing the remaining forest after concessionaires depart.

These examples indicate the scope of potential improvements in natural resource management, and could be greatly extended. However, it should not be forgotten that population growth is also a variable in the resource/population equation. In countries such as China, Cuba, Korea, and Sri Lanka that have led the Third World in the demographic transition to low growth rates, two mutually reinforcing strategies have worked. First, basic health care and family planning services have been widely accessible. In countries where two out of every five children die before the age of five from easily preventable or curable diseases, there is little reason for families to limit their births, and where contraceptive supplies and information have not been broadly distributed, the majority of women who want to delay or prevent further births are not adequately protected.

Second, broad-based economic and social development has changed the conditions that perpetuate high fertility and mortality. Women, who are the basic health providers and managers of household resources, have been able to participate fully in development. Basic services, such as primary education and access to safe drinking water, are available to virtually all. Development strategies that expand urban and rural employment opportunities as rapidly as possible provide escapes from poverty and reduce the most severe of all wastages of resources—the wastage of human resources.

In sum, there is considerable uncertainty about the future interactions of population, resources, and the environment, but there is room to maneuver. Although population numbers in developing countries will inevitably be much larger when world population finally stabilizes, those numbers could be stopped short of the additional 5 billion currently projected for developing countries by wise, humane development and population policies adopted now. This will help relieve further inevitable pressures on natural resources and the environment. Those pressures can be further reduced by strengthening the management of the natural resource base. There is no reason to conclude that substantial, sustainable improvements in living conditions for all the world's people are beyond reach and no reason to neglect opportunities to promote that goal by adopting policies to bring the two sides of the equation into balance, so that sustainable population numbers will be balanced with sustainable resource supplies and environmental quality.□

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